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American Foundryman

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A War-Time Convention

THE 46th Annual Convention of our Association will be truly a war-time gathering of the leaders of the foundry industry, a conference to further in an intensive way the part our industry is playing and will play in the production of vital war material. It will be the most important event the Association has ever held, even more important than those conventions and exhibits held during World War I, which were so important in those days.

From the standpoint of the exhibitors, it is not a question of selling equipment, because most manufacturers have more orders at the present time than they can handle. The main objective of this convention is that of aiding the government in its war production efforts and the exhibitors are affording the opportunity for contact between those who are responsible for furnishing equipment and the foundryman who is using this equipment and wishes to increase his production. There is no question that the foundry industry is playing a most important part in war production and anything that can be done by the exhibitors to further this effort will definitely assist the government in what it must do to quickly supply our combat forces.

The importance of the convention sessions with their extensive list of papers on the most timely and important phases of casting production, research and operation can readily be seen from a review of the pages of this issue. Never before have our members, who contribute to the advancement of the industry, been so ready to impart their experiences and results as at this time in their endeavor to make this convention of the greatest possible direct aids to those who attend and those who will study the **Transactions.**

This is our opportunity to get together in Cleveland the week of April 20 to help Uncle Sam win this war.

H. S. Simpson

H. S. SIMPSON, President
American Foundrymen's Association.

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American Foundryman

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Entered as second class matter July 22, 1938, at the post office at Chicago, Illinois, under the Act of March 3, 1879.

Increased War Production in Foundries To Be Spotlighted at 1942 Convention

Technical Discussions and Exhibits Coordinated To Make Available Maximum Opportunities for Securing All Types of Information on Materials, Equipment, and Production Methods Applicable to Foundry Products in War Time. Government Agencies Co-operating.

ON April 20, the most important National gathering of foundrymen to be held for many years, will open at the Cleveland Public Auditorium, Cleveland, Ohio, and will continue through Friday, April 24. The 1942 convention of your Association has been designed to make available to the foundrymen of this hemisphere, and particularly those in the United States and Canada, the greatest concentration of information on all subjects which will aid the individual foundryman to increase his production of war materials.

War Activities

Many phases of the technical program will deal with such wartime problems as substitution and conservation of materials, equipment and material priorities, plant protection and price control regulations. The exhibit will provide foundrymen with a place to secure advice on the types of supplies and equipment necessary to expand their production and also on how they may use their present equipment to better advantage. The latter is most important in these times when it is necessary to increase plant production as quickly as possible.

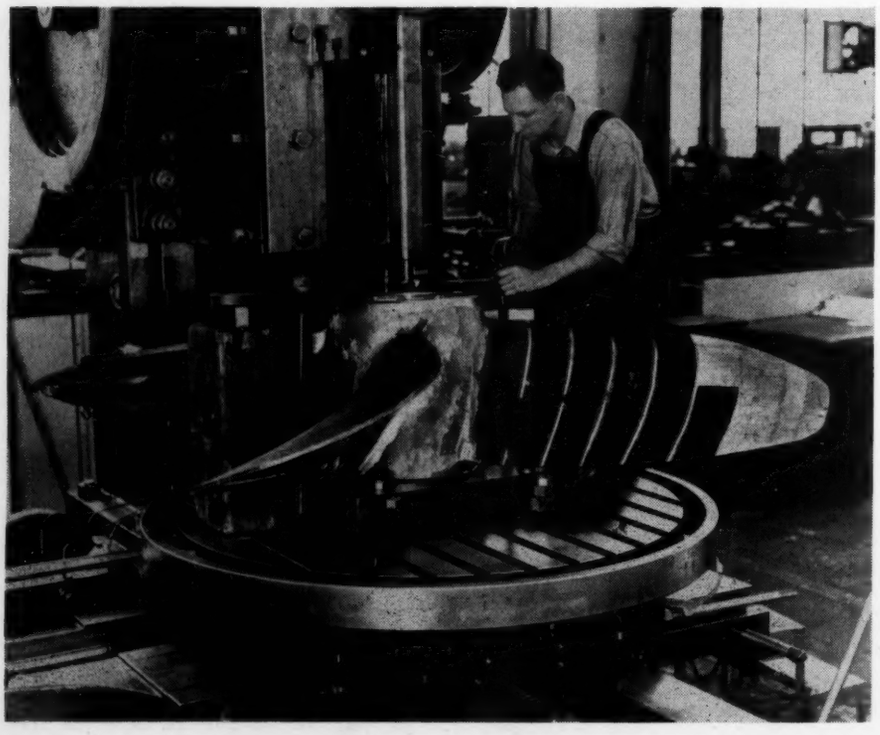
Cooperation With Government Agencies

As evidence of cooperation of the Foundry Industry with the Government in this "War of Production," various departments, bureaus and boards of the Government have accepted invitations to set up offices in the North Hall of the Cleveland Public Auditorium. Of special interest to the individual foundryman will be the three offices of the War Production Board (WPB), one covering priorities on foundry equipment, another priorities on materials, and the third, contract distribution; and the two offices of the Office of Price Administration, one for non-ferrous castings and the other for ferrous castings. Here, again, the individual foundryman may secure official answers to his problems in those fields. This set-up should meet with great approval to those shop men who need help and the Association adds this to a long list of their services.

In addition, special war production sessions will be held on Tuesday, Thursday and Friday, April 21, 23 and 24, at 11:45 a. m., to inform foundrymen generally of the part the various divisions of the industry are playing, and will continue to play in increasing importance, in the National Offense Program. The special speakers for these sessions will be Col. H. M. Reedall, Cleveland Ordnance District, U. S. Army Ordnance; Rear Admiral George Pettengill, Commandant, Washington Navy Yard, Washington, D. C., and W. F. Patterson, Chief, Federal Committee on Apprenticeship, Washington, D. C.

Plant Protection

Another session which will emphasize the war time atmosphere of the convention will be the session at 2:30 p. m., Wednesday, April 22, on plant defense and protection. At this session, James R. Allan, International Harvester Co., Chicago, will present and discuss the new Code of Recommended Practices for the Protection of Life, Property and Production in the Foundry Industry During War Time. This code has been drawn up by a committee, of which Mr. Allan is chairman, at the request of the Office of Civilian Defense, Washington, D. C., and has now been submitted to that organiza-



Cutting a keyway in a cast submarine propeller.
(Official U. S. Navy Photo)

Chairmen for Gray Iron Sessions

Dr. A. E. Schuh

R. F. Hine

Dr. J. T. MacKenzie

P. T. Bancroft

M. Kuniansky

S. C. Massari

Authors of Steel Papers

J. A. Westover

H. F. Taylor

E. A. Rominski

S. W. Brinson

F. B. Riggan

R. H. Stone

Chairmen, Co-Chairmen and Speakers at Special Sessions

J. R. Allan

H. S. Simpson

W. F. Patterson

D. J. Reese

Harold J. Roast

D. P. Forbes

Chairmen, Co-Chairmen and Speakers at Malleable Sessions

J. H. Lansing

D. F. Sawtelle

W. D. McMillan

Dr. H. A. Schwartz

C. F. Joseph

R. M. Cherry

Chairmen, Co-Chairmen and Speakers at Non-Ferrous Sessions

C. O. Thieme

W. Romanoff

W. B. George

E. F. Hess

D. F. O'Connor

W. J. Laird

Plant Defense and Protection at Wednesday Meeting

JAMES R. ALLAN, International Harvester Co., Chicago, chairman of the A.F.A. Industrial Hygiene Codes Committee, will discuss the *"Code of Recommended Practices for the Protection of Life, Property and Production in the Foundry Industry During War"* at a session to be held Wednesday, April 22, at 2:30 P. M. This code has been drafted at the request of the U. S. Government through the Office of Civilian Defense and the work was done by the same Industrial Hygiene Codes Committee personnel which has been so successful in drafting codes for the safety and protection of foundry workers.

In the preparation of this new code, which has been submitted to the Office of Civilian Defense, Washington, D. C., for comment and criticism before publication, the committee which drafted the code kept in mind, first, the effectiveness of the recommendations; second, the minimum cost to accomplish the desired results; and third, minimum time required to prepare for the protection and defense of property. The code covers a wide variety of problems in connection with plant defense and protection. At the request of the Mayor of Chicago, who is Coordinator, Office of Civilian Defense, Chicago Metropolitan Area, it was submitted to the Chicago Civilian Defense Committee and has since been endorsed for publication by that committee, by the Chicago Association of Commerce and by the Committee on Workman's Compensation, Health and Safety of the Illinois Manufacturers' Association. Telegrams and letters to this effect have been sent by the former and latter organizations to proper authorities in Washington.

tion for official action before publication.

The convention and exhibit will open at 9:00 a. m., Monday, April 20. The first and opening meeting, at which President H. S. Simpson and Vice President D. P. Forbes will preside, is scheduled for 11:00 a. m. The opening meeting will feature an address of welcome by the Mayor of Cleveland and an address by Col. H. M. Reedall, Cleveland Ordnance District, U. S .Army Ordnance.

Special OPA Meeting

At 4:00 p. m., Tuesday, April 21, there will be a joint meeting of the ferrous and non-ferrous

Authors of Non-Ferrous Papers
A. T. Ruppe (left) and J. E. Crown

groups to discuss Government price control, at which representatives of the ferrous and non-ferrous castings sections of the Office of Price Administration will discuss this subject.

Western Hemisphere Congress

An atmosphere of Hemisphere Solidarity, which is becoming more evident daily in view of world events, will be added to this convention. On Monday evening at 5:30 a reception will be held for guests from South and Central American countries and their consuls in the United States. At 8:00 p. m., the session of the Western Hemisphere Foundry Conference will be held at which several papers will be presented by Central and South American authors.

Technical Program

The technical program will begin at 2:30 p. m., Monday, April 20. Never in the history of the Association has such a comprehensive technical program been arranged. In accordance with the practice in other years, which is most important now when the conservation of time is a problem, the sessions

Steel Session Author (left) C. W. Briggs and Chairman L. C. Wilson

on subjects of interest to the various branches of the industry have been arranged in such a manner that those attending need spend minimum time to secure the technical information they desire.

Sessions on non-ferrous and malleable production problems will be held on Monday and Tuesday, April 20 and 21, as will sessions of the patternmaking division. Gray iron and steel sessions will be held on Wednesday, Thursday and Friday, April 22, 23 and 24.

For details of the program of convention sessions, see accompanying pages.

Shop Courses

In addition, the program will be replete with sessions of general interest. The popular gray iron shop courses begin on Tuesday. The subject for discussion this year is shrinkage. Practical shrinkage theories and shrinkage in automotive, pressure and general castings will be covered.

There will be four sessions of the annual sand shop course and this year the course will feature fundamentals and sand control. W. G. Reichert, American Brake Shoe & Foundry Co., Mahwah, N. J., will speak at each of the sessions.

Core Practice Lectures

A feature of the 1942 convention will be the continuance of

(Continued on Page 11)

Morris Cohen (left) and R. R. Adams, Authors of Gray Iron Papers

1942 Lecture Course Speaker and Chairmen Lecture Course Sessions

L. P. Robinson

J. B. Caine

R. F. Lincoln

E. C. Zirzow

B. D. Claffey

H. W. Dietert

Annual Convention Program to Stress Castings Production for War Machinery

Tentative Schedule of Sessions
1942 Annual A.F.A. Convention
April 20-24

MONDAY, APRIL 20

9:00 AM—Registration Opens.

11:00 AM—Opening Meeting.

Chairman—President H. S. Simpson.
Vice-Chairman—Vice-President D. P. Forbes.

Opening of Congress by President Simpson.
Address of Welcome.

Address by Col. H. M. Reedall, Cleveland Ordnance District, U. S. Army Ordnance.

2:30 PM—Non-Ferrous Session.

Chairman—M. V. Healey, General Electric Co., Schenectady, N. Y.
Co-Chairman—D. Frank O'Connor, Watts Regulator Co., Lawrence, Mass.

Plaster Molds for Precision Non-Ferrous Castings, by Henry Hagemeyer, Castings Patent Corp., Chicago, Illinois.

Tentative Recommended Practices for Tin Bronzes, presented by E. F. Hess, Ohio Injector Co., Wadsworth, Ohio.

Some Causes of Gas Unsoundness and How to Eliminate Them, by H. L. Smith, Federated Metals Div., American Smelting & Refining Co., Pittsburgh, Pa.

2:30 PM—Malleable Session.

Chairman—C. F. Joseph, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.
Co-Chairman—R. J. Anderson, Belle City Malleable Iron Co., Racine, Wis.

Gating Malleable and Armasteel Castings, by Fred Reeves, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.

Sand Control in a Mechanized Malleable Foundry, by D. F. Sawtelle, Malleable Iron Fittings Co., Branford, Conn.

Studies on Malleabilization and Physical Properties of Some Copper Containing Malleable Irons, by C. H. Lorig and A. R. Elsea, Battelle Memorial Institute, Columbus, Ohio.

4:30 PM—Core Practice-Lecture Course.

Chairman—E. C. Zirzow, National Malleable & Steel Castings Co., Cleveland, Ohio.
Lecturer—H. W. Dietert, Harry W. Dietert Co., Detroit, Mich.

5:30 PM—Reception to Guests from Central and South American Countries.

8:00 PM—Western Hemisphere Foundry Conference.

Chairman—Harold J. Roast, Canadian Bronze Co., Ltd., Montreal, Canada.
Co-Chairman—J. S. Vanick, International Nickel Co., New York City, N. Y.

Some Aspects of the Gray Iron Founding Practice in Brazil, by Miguel Siegel, Instituto de Pesquisas Technologicas, Sao Paulo, Brazil.

Brass Founding in Mexico, by H. H. Miller, Fundicion de Bronce Miller, Torreon, Coah., Mexico.

Brazilian Foundry Industry, by H. A. Hunnicutt, Industrias Chimicas Brasileiras, Sao Paulo, Brazil.

Designing for Foundry Production, by Dr. Ernest Geiger, Sao Paulo, Brazil.

A Multi-Purpose Brazilian Foundry, by Luiz Dumont Villares, Pirie, Villares & Cia., Ltda., Sao Paulo, Brazil, S. A.

Chairmen, Co-Chairmen and Speakers at Engineering and Foreman Training Sessions

S. D. Moxley

V. J. Swanson

F. G. Sefing

W. Odom

C. J. Freund

W. E. George

Authors of Sand Research Papers

E. Pragoff, Jr.

N. J. Dunbeck

E. O. Lissell

C. P. Albus

W. A. Hambley

E. J. Ash

8:00 PM—Patternmaking Session.

Chairman—Frank C. Cech, Cleveland Trade School, Cleveland, Ohio.

Co-Chairman—V. J. Sedlon, Master Pattern Co., Cleveland, Ohio.

Design of Core Boxes and Driers for Core Blowing, by O. A. Van Sickle, City Patterns Works, Detroit, Michigan.

Equipment for Blowing Cores, by R. F. Lincoln, Osborn Mfg. Co., Cleveland, Ohio.

Production of Copper Patterns by Electro Forming, by A. K. Laukel, Electro-Chemical Pattern & Mfg. Co., Detroit, Mich.

TUESDAY, APRIL 21

9:00 AM—Sand Shop Course (Session 1).

Chairman—D. F. Sawtelle, Malleable Iron Fittings Co., Branford, Conn.

Fundamentals of Sand Control, by W. G. Reichert, American Brake Shoe & Foundry Co., Mahwah, New Jersey.

9:00 AM—Gray Iron Shop Course (Session 1).

Chairman—W. S. Linnell, Wisconsin Steel Co., Chicago, Ill.

Practical Theory of Shrinkage.

Discussion Leader—George Timmons, Climax Molybdenum Co., Detroit, Mich.

10:00 AM—Malleable Session.

Symposium on Graphitization (Section 1).

Chairman—Dr. H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland, Ohio.

Co-Chairman—D. P. Forbes, Gunite Foundries Corp., Rockford, Ill.

Principles of Graphitization, by Dr. H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland, Ohio.

The Suppression of Graphitization by Supercooling, by C. H. Junge, National Malleable & Steel Castings Co., Cleveland, Ohio.

Some Effects of Hydrogen on the Time of Malleabilization, by C. H. Lorig and M. L. Samuels, Battelle Memorial Institute, Columbus, Ohio.

Temperature Control of Graphitizing Furnaces, by J. H. Lansing, Malleable Founders' Society, Cleveland, Ohio.

Atmosphere Control in Annealing Furnaces, by R. J. Cowan, Surface Combustion Corp., Toledo, Ohio.

(Symposium concluded at afternoon session.)

10:00 AM—Non-Ferrous Session.

Chairman—W. J. Laird, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Co-Chairman—Wm. Romanoff, H. Kramer & Co., Chicago, Ill.

Effect of Furnace Atmospheres on Heat Treating of Magnesium and Aluminum Alloys, by D. V. Ludwig, Capitol Foundry Corp., Long Island City, New York.

Salvage of Aluminum Alloys by Welding, by A. T. Ruppe and A. J. Juroff, Bendix Products Div., Bendix Aviation Corp., South Bend, Ind.

Annual Business Meeting of Non-Ferrous Division, A.F.A.

10:00 AM—Apprentice Training Session.

Chairman—Jas. G. Goldie, Cleveland Trade School, Cleveland, Ohio.

Co-Chairman—Dean C. J. Freund, University of Detroit, Detroit, Mich.

Foundry Apprenticeship Now, How and Why, by Donald F. Lane, Bethlehem Steel Co., Sparrows Point, Md.

Foundry Defense Training Question Box.

Discussion Leader—O. F. Carpenter, Associate District Representative, Training Within Industry, Detroit, Mich.

11:45 AM—Special War Production Session.

Chairman—Fred J. Walls, International Nickel Co., Detroit, Mich.

Address by Rear Admiral George Pettingill, Retd., Commandant and Superintendent, Naval Gun Factory, Washington, D. C.

12:30 PM—Non-Ferrous Division Round-Table Luncheon.

Chairman—B. A. Miller, Cramp Brass & Iron Foundries Div., Baldwin Locomotive Works, Philadelphia, Pa.

Co-Chairman—C. O. Thieme, H. Kramer & Co., Chicago, Ill.

Discussion Topics and Leaders:

"Some Causes of Porosity in Silicon Bronze Castings," by J. E. Crown, U. S. Naval Gun Factory, Washington, D. C.

"Some Causes of Porosity in Navy 'G' and 'M' Metals," by W. B. George, R. Lavin & Sons, Chicago, Ill.

Conservation of Tin and Use of Secondary Metals in Bronze Castings.

12:30 PM—Malleable Division Luncheon.

Chairmen, Co-Chairmen and Speakers for Patternmaking Sessions

E. T. Kindt

G. K. Dreher

V. J. Sedlon

E. J. Brady

A. K. Laukel

F. C. Cech

Refractories and Job Evaluation Chairmen, Co-Chairmen and Authors

J. A. Bowers

R. A. Clark

E. L. Berry

E. A. Berg

R. E. Wilke

F. E. Wartgow

2:30 PM—Malleable Session.

Symposium on Graphitization (Section 2).

Chairman—Dr. H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland, Ohio.

Co-Chairman—C. F. Joseph, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.

Intermittent Annealing Furnaces, by W. R. Bean and W. R. Jaeschke, Whiting Corp., Harvey, Ill.

Electric Furnace Annealing, by R. M. Cherry, General Electric Co., Schenectady, N. Y.

Tunnel Kiln Annealing, by R. J. Anderson, Belle City Malleable Iron Co., Racine, Wis.

The Promotion of Annealing Rate by the Selection of Chemical Composition, by W. D. McMillan, International Harvester Co., Chicago, Ill.

Arrested Anneal Malleables, by D. P. Forbes, Gunite Foundries Corp., Rockford, Ill.

2:30 PM—Patternmaking Session.

Chairman—E. J. Brady, Western Foundry Co., Chicago, Ill.

Co-Chairman—A. Pyle, Jr., Pyle Pattern & Mfg. Co., Muskegon, Mich.

Plastic Coatings for Core Boxes and Patterns, Report of investigation by George Dreher, Ampco Metal, Inc., Milwaukee, Wis.

Discussion of Rubber Coatings for Core Boxes, by J. E. Crown, U. S. Naval Gun Factory, Washington, D. C.

Specifications for Foundry and Pattern Lumber, by E. T. Kindt, Kindt-Collins Co., Cleveland, Ohio.

Driers and Green Topping Cores, by George Gedeon, Aluminum Co. of America, and Frank C. Cech, Cleveland Trade School, Cleveland, Ohio.

4:00 PM—Joint Meeting of Ferrous and Non-Ferrous Group.

Discussion of Government Price Control

Discussion Leaders:

Representative from Office of Price Administration, Copper and Brass Section.

Representative from Office of Price Administration, Castings Unit, Steel, Iron and Steel Products Section.

4:30 PM—Core Practice-Lecture Course.

Chairman—L. P. Robinson, Werner G. Smith Co., Cleveland, Ohio.

Lecturer—H. W. Dietert, Harry W. Dietert Co., Detroit, Mich.

6:30 PM—Annual Apprentice Instructors' Dinner.

Presiding—Jas. G. Goldie, Cleveland Trade School, Cleveland, Ohio.

6:30 PM—Foreman Training Group, Dinner and Discussion.

Chairman—W. E. George, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich.

Co-Chairman—G. J. Leroux, National Malleable & Steel Castings Co., Cleveland, Ohio.

Training of Victory Workers, by V. J. Swanson, Tractor Works, International Harvester Co., Chicago, Ill.

Teaching Foremen to Teach, by W. Odom, Wm. Odom Associates, Chicago, Ill.

8:00 PM—Refractories for Foundry Use.

Chairman—J. A. Bowers, American Cast Iron Pipe Co., Birmingham, Ala.

Co-Chairmen—Charles Reed, Jr., Retort & Fire Brick Co., Chicago, Ill., and R. E. Wilke, Deere & Co., Moline, Ill.

Natural Stone as a Cupola Refractory, by J. A. Bowers, American Cast Iron Pipe Co., Birmingham, Ala.

Monolithic Cupola Linings, by R. A. Clark, Lakey Foundry & Machine Co., Muskegon, Mich.

Patching in the Cupola, by C. S. Reed, Jr., Chicago Retort & Fire Brick Co., Chicago, Ill.

WEDNESDAY, APRIL 22

9:00 AM—Sand Shop Course (Session 2).

Chairman—C. P. Randall, Eastern Clay Products Co., Eifort, Ohio.

Practical Fundamentals of Sand Shop Control, by W. G. Reichert, American Brake Shoe & Foundry Co., Mahwah, N. J.

9:00 AM—Gray Iron Shop Course (Session 2).

Chairman—R. F. Hine, Studebaker Corp., South Bend, Ind.

Shrinkage in Automotive Castings.

Discussion Leader (to be announced).

10:00 AM—Annual Business Meeting and Awards Lecture.

Address of President Simpson.

Reports of Officers.

Awards Presentation.

Awards Lecture.

2:30 PM—Plant Defense and Protection.

Report of Committee on Plant Protection During War Times, by Jas. R. Allan, International Harvester Co., Chicago, Ill.

Chairmen and Discussion Leaders for Sand and Gray Iron Shop Courses

C. P. Randall

E. E. Woodliff

H. H. Judson

E. J. Carmody

G. Timmons

Chairmen, Co-Chairmen and Speakers for Cost and Plant Equipment Sessions

E. W. Beach

H. B. Nye

W. R. Bean

W. R. Jennings

J. Thomson

R. L. Lee

2:30 PM—Gray Iron Session.

Chairman—Max Kuniansky, Lynchburg Foundry Co., Lynchburg, Va.
Co-Chairman—John Lowe, Battelle Memorial Institute, Columbus, Ohio.

Temperature Measurement of Molten Cast Iron With the "Rayotube" and Optical Pyrometer, by R. H. Koch and Dr. A. E. Schuh, U. S. Pipe & Foundry Co., Burlington, N. J.

Electronic Structure and Polymorphism of Iron Alloys, by Dr. Roman Smoluchowski, Research Laboratory, General Electric Co., Schenectady, New York.

Cupola Control, by Fulton Holtby and H. F. Scobie, University of Minnesota, Minneapolis, Minn.

Direct Determination of Combined Carbon in Cast Iron and Steel, by J. G. Donaldson, Battelle Memorial Institute, Columbus, Ohio. (Presented by title.)

2:30 PM—Steel Session.

Chairman—F. A. Melmoth, Detroit Steel Casting Co., Detroit, Mich.
Co-Chairman—K. V. Wheeler, American Steel Castings Co., Newark, N. J.

Atmospheric Pressure and the Steel Casting—A New Technique of Gating and Risering, by H. F. Taylor and E. A. Rominski, Naval Research Laboratory, Washington, D. C.

Studies of Center Line Shrinkage, by J. A. Duma and S. W. Brinson, Norfolk Navy Yard, Portsmouth, Va.

3:00 PM—Chapter Delegate Conference.

4:30 PM—Core Practice-Lecture Course.

Chairman—J. B. Caine, Sawbrook Steel Casting Co., Lockland, Ohio.
Lecturer—H. W. Dietert, Harry W. Dietert Co., Detroit, Mich.

6:30 PM—Chapter Officers' Dinner.

Chairman—D. P. Forbes, Gunite Foundries Corp., Rockford, Ill.

6:30 PM—Annual Engineering Foundry Instructors' Dinner.

8:00 PM—Job Evaluation and Time Study Session.

Chairman—F. E. Wartgow, American Steel Foundries, East Chicago, Ind.
Co-Chairman—Jeff. Alan Westover, Dyer Engineers, Inc., Buffalo, N. Y.

The Use of Job Evaluation in the Application of Time Study, by E. L. Berry and E. A. Berg, Link-Belt Co., Chicago, Ill.

8:00 PM—The Foundry Industry and Engineering Training Session.

Chairman—F. G. Sefing, International Nickel Co., New York City, N. Y.

Report of Survey of Foundry Instruction, by A.F.A. Committee on Cooperation with Engineering Schools.

Engineering Graduates in the Foundry, by S. D. Moxley, American Cast Iron Pipe Co., Birmingham, Ala.

The College Student Views the Foundry Industry, by C. J. Freund, Dean of Engineering, University of Detroit, Detroit, Mich.

8:00 PM—Sand Research Session.

Chairman—L. B. Knight, Jr., National Engineering Co., Chicago, Ill.
Co-Chairman—F. L. Weaver, Great Lakes Foundry Sand Co., Detroit, Mich.

Investigation of Durability of Foundry Sands, by J. CoVan, University of Illinois, Urbana, Ill.

"A Foundry Investigation of Bond Clay Properties," by A. S. Nichols, F. W. Hintze and F. L. Overstreet, Illinois Clay Products Co., Chicago, Ill.

The Drying Out of Synthetic Sands, by N. J. Dunbeck, Eastern Clay Products Co., Eifort, Ohio.

8:00 PM—Steel Session.

Chairman—L. C. Wilson, Reading Steel Casting Div., American Chain and Cable Co., Inc., Reading, Pa.

Steel Pouring Refractories, by R. H. Stone, Vesuvius Crucible Co., Swissvale, Pa.

The Use of the Hot Strength Test as a Tool for Controlling Core Mixtures, by F. B. Riggan, Key Co., E. St. Louis, Ill.

Report of Committee on Radiography.

THURSDAY, APRIL 23

9:00 AM—Gray Iron Shop Course (Session 3).

Chairman—H. H. Wilder, Detroit Stoker Co., Monroe, Mich.

Shrinkage in Pressure Castings.

Discussion Leader—H. H. Judson, Goulds Pumps, Inc., Seneca Falls, N. Y.

9:00 AM—Sand Shop Course (Session 3).

Chairman—E. E. Woodliff, Detroit, Mich.

Practical Fundamentals of Sand Control, by W. G. Reichert, American Brake Shoe & Foundry Co., Mahwah, N. J.

Apprentice Training and Gray Iron Chairmen, Co-Chairmen and Authors

J. G. Goldie

R. G. McElwee

F. Holtby

C. O. Burgess

O. F. Carpenter

R. H. Koch

Steel Session Chairmen, Co-Chairmen and Authors

F. A. Melmoth

F. B. Anderson

J. A. Duma

H. D. Phillips

J. H. Hall

C. E. Sims

10:00 AM—Sand Research Session.

Chairman—Dr. H. Ries, Ithaca, N. Y.
Co-Chairman—H. A. Deane, Brake Shoe & Castings Div., American Brake Shoe & Foundry Co., New York City, N. Y.

Dry Sand Molding Procedure for Heavy Castings, by W. A. Hambley and A. Lebesh, Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Sea Coal and Fuel Oil in Foundry Sands, by E. C. Zirzow, National Malleable & Steel Castings Co., Cleveland, Ohio.

Report of Committee on Sintering Sands.

10:00 AM—Foundry Costs and Merchandising of Castings.

Chairman—R. L. Lee, Liberty Foundry Div., Grede Foundries, Inc., Wauwatosa, Wis.

Round Table Discussion on Current Cost Methods Problems.

10:00 AM—Cupola Research Project Session.

Chairman—D. J. Reese, International Nickel Co., New York City, N. Y.

Reports of Sub-Committees of Cupola Research Project.

11:45 AM—Special War Production Session.

Chairman—Dean C. J. Freund, University of Detroit, Detroit, Mich.

Training Methods for War Production, by Wm. F. Patterson, Federal Committee on Apprenticeship, Washington, D. C.

12:30 PM—Steel Division Round-Table Luncheon.

Chairman—R. S. Munson, Atlantic Steel Casting Co., Chester, Pa.

Subjects for informal discussion: Heading and Gating—Magnetic Testing—Sand Testing at Ordinary and Elevated Temperatures.

2:30 PM—Gray Iron Session.

Chairman—S. C. Massari, Association of Manufacturers of Chilled Car Wheels, Chicago, Ill.
Co-Chairman—R. G. McElwee, Alloy Div., Vanadium Corp. of America, Detroit, Mich.

Machinable 1.5 Per Cent and 2 Per Cent Chromium Cast Irons to Resist Deterioration at High Temperatures, by C. O. Burgess and A. E. Schrubsall, Union Carbide and Carbon Research Laboratories, Niagara Falls, N. Y.

Cast Iron—Strength vs. Structure, by R. R. Adams, Battelle Memorial Institute, Columbus, Ohio.

Metallurgical Study of Cast Iron for Glass Forming Molds, by W. H. Bruckner, University of Illinois, Urbana, Ill., and H. Czyzewski, Caterpillar Tractor Co., Peoria, Ill.

2:30 PM—Plant and Plant Equipment.

Chairman—James Thomson, Continental Roll & Steel Foundry Co., East Chicago, Ind.
Co-Chairmen—W. R. Jennings, John Deere Tractor Co., Waterloo, Iowa; E. W. Beach, Campbell Wyant & Cannon Foundry Co., Muskegon, Mich.

Casting Cleaning in a Gray Iron Foundry, by H. B. Nye, New York Air Brake Co., Watertown, N. Y.

Priorities and Foundry Equipment, by W. R. Bean, Chief, Foundry Equipment and Supplies Unit, Tools Section, War Production Board, Washington, D. C.

4:30 PM—Core Practice-Lecture Course.

Chairman—B. D. Claffey, General Malleable Corp., Waukesha, Wis.
Lecturer—H. W. Dietert, Harry W. Dietert Co., Detroit, Mich.

7:00 PM—Annual Dinner, A.F.A.

FRIDAY, APRIL 24

9:00 AM—Sand Shop Course (Session 4).

Chairman—E. E. Woodliff, Detroit, Mich.

Practical Fundamentals of Sand Control, by W. G. Reichert, American Brake Shoe & Foundry Co., Mahwah, N. J.

9:00 AM—Gray Iron Shop Course (Session 4).

Chairman—P. T. Bancroft, Republic Coal & Coke Co., Moline, Ill.

Shrinkage—General Castings.

Discussion Leader—E. J. Carmody, C. C. Kawin Co., Chicago, Ill.

10:00 AM—Steel Session.

Chairman—C. E. Sims, Battelle Memorial Institute, Columbus, Ohio.
Co-Chairman—John Howe Hall, Philadelphia, Pa.

Methods for Producing Steel for Castings.

Acid Electric Furnace Slag Control, by John Juppenlatz, Lebanon Steel Foundry Co., Lebanon, Pa.

Authors of Malleable Papers

M. L. Samuels

C. H. Lorig

F. E. Reeves

R. J. Cowan

W. R. Jaeschke

C. H. Junge

Acid Open Hearth Practice for Steel Castings, by G. S. Baldwin, Standard Steel Works Division, Baldwin Locomotive Works, Burnham, Pa., and C. W. Briggs, Steel Founders' Society of America, Cleveland, Ohio.

Making Navy Steel in Basic Electric Furnaces, by S. W. Brinson and F. B. Anderson, Norfolk Navy Yard, Portsmouth, Va.

Production of Uniform Steel for a Light Castings Foundry, by C. H. Kain and L. W. Sanders, Lake & Elliott, England. (I.B.F. Exchange Paper.)

10:00 AM—Gray Iron Session.

Chairman—Dr. J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham, Ala.
Co-Chairman—V. A. Crosby, Climax Molybdenum Co., Detroit, Mich.

Production Hardening of Close Grain Cast Iron, by D. V. Ludwig, Capitol Foundry Corp., Long Island City, N. Y.

Effects of Alloys on Transformation, by R. G. McElwee, Vanadium Corporation of America, Detroit.

Effects of Ladle Inoculation on Austenitic Cast Iron, by J. T. Eash, International Nickel Co., Bayonne, New Jersey.

10:00 AM—Sand Research Session.

Chairman—N. J. Dunbeck, Eastern Clay Products Co., Eifort, Ohio.
Co-Chairman—C. M. Saeger, Jr., National Bureau of Standards, Washington, D. C.

Report of Further Investigations of Sand Properties at High Temperatures, by J. R. Young, Cornell University, Ithaca, New York.

A Study of the Flowability of Foundry Sands, by E. O. Lissell and E. J. Ash, University of Michigan, Ann Arbor, Mich.

Resin Binders in Molding Sand, by E. Pragoff, Jr., and C. P. Albus, Hercules Powder Co., Wilmington, Del.

11:45 AM—Special War Production Session.

(Speaker to be announced.)

2:00 PM—Steel Session.

Chairman—R. A. Gezelius, General Steel Castings Corp., Eddystone, Pa.
Co-Chairman—Henry D. Phillips, Lebanon Steel Foundry, Lebanon, Pa.

Grinding Wheel Cost Control, by Jeff. Alan Westover, Dyer Engineers, Inc., Buffalo, N. Y.

Welding of Medium Carbon Steel Castings by Metal Arc Process, by S. E. Mueller, Falk Corp., Milwaukee, Wis.; A. B. Smith, American Bureau of Shipping, Chicago, Ill., and J. F. Oesterle, University of Wisconsin, Madison, Wis.

Report of Committee on Developments in Magnetic Powder Test.

2:00 PM—Gray Iron Session.

Chairman—Dr. A. E. Schuh, United States Pipe & Foundry Co., Burlington, N. J.

Elastic Properties of Some Alloy Cast Irons, by A. I. Krynitsky and C. M. Saeger, Jr., National Bureau of Standards, Washington, D. C.

Statistical Methods as an Aid to the Control of Foundry Operations, by H. H. Fairfield, Canadian Dept. of Mines and Resources, Ottawa, Canada.

Phosphorus vs. Growth of Cast Iron, by Morris Cohen and M. N. Dastur, Massachusetts Institute of Technology, Cambridge, Mass.

4:30 PM—Core Practice-Lecture Course.

Chairman—R. F. Lincoln, Osborn Mfg. Co., Cleveland, Ohio.

Lecturer—H. W. Dietert, Harry W. Dietert Co., Detroit, Mich.

Chairmen, Co-Chairmen and Speakers for Sand Research, Gray Iron and Special Sessions

F. L. Weaver

J. CoVan

Dr. H. Ries

H. A. Deane

L. B. Knight, Jr.

C. M. Saeger, Jr.

W. H. Bruckner

A. E. Schrubsall

F. J. Walls

J. Lowe

M. N. Dastur

J. S. Vanick

V. A. Crosby

H. F. Scobie

H. H. Fairfield

A. I. Krynitsky

J. T. Eash

H. Czyzewski

Increased War Production in Foundries

(Continued from Page 4)

the lecture course on core practices begun last year by Harry W. Dietert and which is to be concluded this year. In addition to these annual convention features, sessions on foundry refractories, job evaluation and time study, foundry sand research, foundry costs and merchandising of castings, plant and plant equipment, apprentice training, engineering training and cupola research will be held.

Exhibitors Offer Wartime Cooperation

The fundamental wartime purposes of this Congress will be further developed in the Foundry and Allied Industries Show. Manufacturers and suppliers of equipment and materials will display their products in four great exhibit halls of the Public Auditorium—in the Main Exhibition Hall, North Hall, Arcade, and upper level of Lakeside Hall.

At previous Foundry Shows exhibitors have displayed their products primarily for sales promotion purposes. This time, however, the dominant theme will be Service to the Industry—helping castings makers increase production and reach a full wartime basis.

Many exhibitors whose entire output has been contracted for months ahead, nevertheless will send representatives to assist foundrymen in utilizing existing materials more efficiently. Some will concentrate on methods of adapting present machines to new war production work. Some will demonstrate cast parts made with their products under government specifications. Others will emphasize conservation of essential materials, the importance of maintenance, and possibilities of substitute materials.

The list of Exhibitors at the 1942 Foundry Show, shown on the following pages, presents vivid evidence that the equipment and supplies branch of the castings industry, as well as foundrymen themselves, are co-operating 100 per cent in the government's all-out war-time program.

Foreman Training in War Time

Mobilizing for victory! Foundries operating 168 hours a week, new plants, new men, new jobs, new problems in man-power, everywhere we turn!

We thought the foreman was having a pretty tough time in the past nine years in meeting the new problems of labor control, social legislation, and changing ideas of management in its relation to Government. Those were but the prelims before the big fight. Now the foreman *really* needs help and training; now management just as vitally needs help in broadening its supervisory forces.

At the Cleveland Convention, Tuesday evening, April 21, there is to be a special Dinner Meeting devoted to Foreman Training. Our committee has booked two top-notch speakers and we promise you a high-lighted session that you who are in management cannot afford to miss. Here they are:

V. J. Swanson, Director of Training, Tractor Works, International Harvester Company, Chicago, Ill.
Subject, *"Training of Victory Workers."*

Wm. Odom, President, Wm. Odom Associates, Management Engineers, Chicago, Ill.
Subject, *"Teaching Foremen to Teach."*

Both Mr. Swanson and Mr. Odom have a real message to tell. You cannot pass up the opportunity to hear them if you are responsible for the expansion and development of man-power in your company. Both men are practical, both combine experience and logic, both will point the way for you to solve your own training problems.

Dinner starts promptly at 6:30 p. m. at the Hotel Statler. Make your reservations early and line up all in your organization who are concerned with the vital problems of man-power.

WALLY E. GEORGE, *Chairman,*
Foreman Training Committee.

Core Practice Lectures Soon Available

"MODERN Core Practices and Theories" is the title of a book by Harry W. Dietert, president, Harry W. Dietert Co., Detroit, who lectured last year and is continuing his series of lectures at this convention on core room production problems. Mr. Dietert has considerably enlarged his lecture course material in the above mentioned book, which covers every phase of core production, from materials used to mechanical equipment for mixing, forming, baking, cleaning, pasting and setting of cores. This is the first comprehensive treatise on core practices ever published and will be used by not only core room foremen and superintendents, but by foundry managers, salesmen, purchasing agents, instructors, students and apprentices.

This book will be available on the first day of the lecture course, April 20, at $5.00 to members and $8.00 to non-members. Orders for books may be placed at the publications booth located at the top of the stairs just behind the registration booth in the Cleveland Public Auditorium or at Spaces 200 and 201 in the North Hall, as shown in the official convention program.

Appreciation of Exhibitors

The American Foundrymen's Association takes this opportunity to express, on behalf of the foundry industry, sincere appreciation to Exhibitors at the 1942 Foundry Congress for the contribution they are thus making to the industry's war-time effort. It has been truly said that "the winner in this war will be the country that can advance the fastest technically with its methods, materials and machines."

Over the years since 1906, when the first exhibit was held in conjunction with an A.F.A. Convention, the manufacturers and suppliers of equipment and materials have played a great part in castings progress. Their constant research and improvements in their products have made the foundry more productive and more efficient. Their continuous co-operation with this Association has contributed to a large extent to the success of these annual meetings.

Now, for the second time, they are playing their part, and a vital one it is, in aiding their country in a great war effort. Throughout World War I their participation in the Foundry Shows of 1914-18 helped America's foundries do their share in producing the tools of Victory. Today their co-operation is even more essential, for today the need is far greater. The A.F.A. and the foundry industry may well be proud of their response, as displayed at the 1942 Foundry Congress.

Co-operators for Victory -- 1942 Exhibitors

(Partial List)

Adams Company, Dubuque, Iowa.
Ajax Electric Co., Inc., Philadelphia, Pa.
Ajax Electric Furnace Corp., Philadelphia, Pa.
Ajax Electrothermic Corp., Trenton, N. J.
Ajax Metal Co., Philadelphia, Pa.
Alpha-Lux Co., Inc., New York, N. Y.
American Air Filter Co., Inc., Louisville, Ky.
American Crucible Co., Shelton, Conn.
American Foundry Equipment Co., Mishawaka, Ind.
American Foundrymen's Association, Chicago, Ill.
American Metal Market, New York, N. Y.
American Optical Co., Chicago, Ill.
American Society for Metals, Cleveland, Ohio.
American Steel Abrasive Co., Galion, Ohio.
Arcade Mfg. Co., Freeport, Ill.
Automatic Transportation Co., Chicago, Ill.
Ayers Mineral Co., Zanesville, Ohio.
Baker-Perkins, Inc., Saginaw, Mich.
C. O. Bartlett & Snow Co., Cleveland, Ohio.
Bay State Abrasive Products Co., Westboro, Mass.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Blaw Knox Co., Pittsburgh, Pa.
Blystone Corp., Cambridge Springs, Pa.
Buckeye Products Co., Cincinnati, Ohio.
Adolph I. Buehler, Chicago, Ill.
Business Publishers International Corp, New York, N. Y.
Campbell-Hausfeld Co., Harrison, Ohio.
Canadian Radium & Uranium Corp., New York, N. Y.
Edwin S. Carman, Inc., Cleveland, Ohio.
Certified Core Oil & Mfg. Co., Cicero, Ill.
Chain Belt Co., Milwaukee, Wis.
Champion Foundry & Machine Co., Chicago, Ill.
Chicago Mfg. & Distributing Co., Chicago, Ill.
Chicago Retort & Fire Brick Co., Chicago, Ill.
Clearfield Machine Co., Clearfield, Pa.
Cleveland Blow Pipe & Mfg. Co., Cleveland, Ohio.
Cleveland Flux Co., Cleveland, Ohio.
Cleveland Pneumatic Tool Co., Cleveland, Ohio.
Cleveland Quarries Co., Cleveland, Ohio.
Cleveland Trade School, Cleveland, Ohio.
Climax Molybdenum Co., New York, N. Y.
L. A. Cohn & Bro., Inc., Chicago, Ill.
Combined Supply & Equipment Co., Buffalo, N. Y.
Conco Engineering Works, Mendota, Ill.
Corn Products Sales Co., New York, N. Y.
Crucible Furnace Co., Charlottesville, Va.
Davenport Machine & Foundry Co., Davenport, Iowa.
Dayton Oil Co., Dayton, Ohio.
Delhi Foundry Sand Co., Cincinnati, Ohio.
Delta Oil Products Co., Milwaukee, Wis.
Wm. Demmler & Bros., Kewanee, Ill.
Despatch Oven Co., Minneapolis, Minn.
Detroit Electric Furnace Div., Kuhlman Electric Co., Bay City, Mich.
De Walt Products Corp., Lancaster, Pa.
Harry W. Dietert Co., Detroit, Mich.
Jos. Dixon Crucible Co., Jersey City, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Dougherty Lumber Co., Cleveland, Ohio.
Duquesne Smelting Corp., Pittsburgh, Pa.
Eastern Clay Products, Inc., Eifort, Ohio.
Electro Refractories & Alloys Corp., Buffalo, N. Y.
Elwell-Parker Electric Co., Cleveland, Ohio.
Eutectic Welding Alloys, Inc., New York, N. Y.
Fanner Mfg. Co., Cleveland, Ohio.
Federal Committee on Apprenticeship, Washington, D. C.
Federal Foundry Supply Co., Cleveland, Ohio.
Federated Metals Div., American Smelting & Refining Co., Whiting, Ind.
Fisher Furnace Co., Chicago, Ill.
The Foundry, Cleveland, Ohio.
Foundry Equipment Co., Cleveland, Ohio.
Freeman Supply Co., Toledo, Ohio.
Fremont Flask Co., Fremont, Ohio.
Frontier Bronze Corp., Niagara Falls, N. Y.
Globe Steel Abrasive Co., Mansfield, Ohio.
Gray Iron Founders' Society, Cleveland, Ohio.
Great Lakes Foundry Sand Co., Detroit, Mich.
Great Western Mfg. Co., Leavenworth, Kan.
Grimes Molding Machine Co., Detroit, Mich.
Grob Brothers, Grafton, Wis.
Benj. Harris & Co., Chicago Heights, Ill.
Hercules Powder Co., Wilmington, Dela.
Herman Pneumatic Machine Co., Pittsburgh, Pa.
Hickman, Williams & Co., Cleveland, Ohio.
Hill & Griffith Co., Cincinnati, Ohio.
Hines Flask Co., Cleveland, Ohio.
Hoffman Foundry Supply Co., Cleveland, Ohio.
E. F. Houghton & Co., Philadelphia, Pa.
Hougland & Hardy, Inc., Evansville, Ind.
Hydro Blast Corp., Chicago, Ill.
Illinois Clay Products Co., Chicago, Ill.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Industrial Minerals Co., Lancaster, Ohio.
International Harvester Co., Chicago, Ill.
International Molding Machine Co., Chicago, Ill.
International Nickel Co., Inc., New York, N. Y.
Ironton Fire Brick Co., Ironton, Ohio.
Jefferson Machine Tool Co., Cincinnati, Ohio.
Johnston & Jennings Co., Cleveland, Ohio.
Kindt-Collins Co., Cleveland, Ohio.
H. Kramer & Co., Chicago, Ill.
The Kron Co., Bridgeport, Conn.

Lancaster Iron Works, Inc., Lancaster, Pa.
Lava Crucible Co. of Pittsburgh, Pittsburgh, Pa.
R. Lavin & Sons, Inc., Chicago, Ill.
J. S. McCormick Co., Pittsburgh, Pa.
Macklin Co., Jackson, Mich.
Mahr Mfg. Co. Div., Diamond Iron Works, Inc., Minneapolis, Minn.
Mall Tool Co., Chicago, Ill.
Malleable Founders' Society, Cleveland, Ohio.
Marathon Chemical Co., Rothschild, Wis.
Martindale Electric Co., Cleveland, Ohio.
Mathews Conveyor Co., Ellwood City, Pa.
Metal Industries Catalog, New York, N. Y.
Metal Progress, Cleveland, Ohio.
Metals & Alloys, New York, N. Y.
Michigan Smelting & Refining Div., Bohn Aluminum & Brass Corp., Detroit, Mich.
Midwest Abrasive Co., Detroit, Mich.
Milwaukee Foundry Equipment Co., Milwaukee Wis.
Mine Saftey Appliances Co., Pittsburgh, Pa.
Modern Equipment Co., Port Washington, Wis.
Monarch Engrg. & Mfg. Co., Curtis Bay, Baltimore, Md.
James A. Murphy & Co., Hamilton, Ohio.
National Engineering Co., Chicago, Ill.
Newaygo Engineering Co., Newaygo, Mich.
Niagara Falls Smelting & Refining Co., Buffalo, N. Y.
Wm. H. Nicholls Co., Inc., Richmond Hill, L. I., N. Y.
S. Obermayer Co., Chicago, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Osborn Mfg. Co., Cleveland, Ohio.
Pangborn Corp., Hagerstown, Md.
Parsons Engineering Corp., Cleveland, Ohio.
Peerless Mineral Products Co., Conneaut, Ohio.
Penn-Rillton Co., New York, N. Y.
Penola, Inc., Pittsburgh, Pa.
Penton Publishing Co., Cleveland, Ohio.
George F. Pettinos, Inc., Philadelphia, Pa.
Pittsburgh Crushed Steel Co., Pittsburgh, Pa.
Pittsburgh Lectromelt Furnace Corp., Pittsburgh, Pa.
Porter-Cable Machine Co., Syracuse, N. Y.
Powermatic Ventilator Co., Cleveland, Ohio.
Productive Equipment Corp., Chicago, Ill.
Pyro Clay Products Co., Oak Hill, Ohio.
Pyrometer Instrument Co., New York, N. Y.
Ramtite Co. Div., S. Obermayer Co., Chicago, Ill.
N. Ransohoff, Inc., Cincinnati, Ohio.
Republic Coal & Coke Co., Chicago, Ill.
Riehle Testing Machine Div., American Machine & Metals, Inc., East Moline, Ill.
Rotor Tool Co., Cleveland, Ohio.
Royer Foundry & Machine Co., Kingston, Pa.
Safety Clothing & Equipment Co., Cleveland, Ohio.
Safety Engineering, New York, N. Y.
Safety Equipment Service Co., Cleveland, Ohio.
Sand Products Corp., Detroit, Mich.
Claude B. Schneible Co., Chicago, Ill.
Schramm, Inc., West Chester, Pa.
F. E. Schundler & Co., Inc., Joliet, Ill.
Scientific Cast Products Corp., Cleveland, Ohio.
Semet-Solvay Co., New York, N. Y.
Seymour & Peck Co., Chicago, Ill.
Simplicity Engineering Co., Durand, Mich.
W. W. Sly Mfg. Co., Cleveland, Ohio.
Smith Facing & Supply Co., Cleveland, Ohio.
Smith Oil & Refining Co., Rockford, Ill.
Werner G. Smith Co., Cleveland, Ohio.
SPO, Inc., Cleveland, Ohio.
Spencer Turbine Co., Hartford, Conn.
Springfield Aluminum Plate & Castings Co., Springfield, Ohio.
Standard Conveyor Co., North St. Paul, Minn.
Standard Sand & Machine Co., Chicago, Ill.
Steel Shot & Grit Co., Boston, Mass.
Steelblast Abrasives Co., Cleveland, Ohio.
Sterling Grinding Wheel Div., Cleveland Quarries Co., Milwaukee, Wis.
Sterling Wheelbarrow Co., Milwaukee, Wis.
Frederic B. Stevens, Inc., Detroit, Mich.
Superior Sand Corp., Massillon, Ohio.
Swan-Finch Oil Corp., Chicago, Ill.
Tabor Mfg. Co., Philadelphia, Pa.
Taggart & Co., Philadelphia, Pa.
Tamms Silica Co., Chicago, Ill.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
Toledo Scale Co., Toledo, Ohio.
United Compound Co., Buffalo, N. Y.
United Oil Mfg. Co., Erie, Pa.
U. S. Bureau of Mines, Pittsburgh, Pa.
U. S. Dept. of Labor, Division of Labor Standards, Washington, D. C.
United States Graphite Co., Saginaw, Mich.
U. S. Hoffman Machinery Co., New York, N. Y.
U. S. Reduction Co., East Chicago, Ind.
Vanadium Corp. of America, New York, N. Y.
Vesuvius Crucible Co., Swissvale, Pa.
Wadsworth Core Machine & Equipment Co., Akron, Ohio.
Walker Mfg. Co., Racine, Wis.
J. D. Wallace & Co., Chicago, Ill.
Western Metals Co., Chicago, Ill.
Whitehead Bros. Co., New York, N. Y.
Whiting Corp., Harvey, Ill.
Harry J. Wolf Shoe Co., Sheboygan, Wis.
Yale & Towne Mfg. Co., Philadelphia, Pa.
Zanesville Sand Co., Zanesville, Ohio.

Ordnance and Government Displays

In addition to the representative displays of equipment and materials for foundry use, ordnance exhibits and governmental displays will add to the interest in the exhibit halls. Displays on labor and defense and on the value of apprentice training will be offered by the Department of Labor. New types of instruments for metallurgical testing will be demonstrated by the Bureau of Mines, as well as devices for promoting plant safety in wartime. A special exhibit dealing with plant protection and defense should be of value to every foundry executive.

The Cleveland Trade School, whose operating exhibit at the 1938 Foundry Show in Cleveland proved so popular, will emphasize this year the value and necessity of specialized training for war production work, as illustrated by the work of its students. Supplementing this exhibit will be displays of molding and patternmaking entries in the A.F.A. Apprentice Contest.

Annual Business Meeting

The annual business meeting is scheduled for 10:00 a. m. on Wednesday, April 22, with President H. S. Simpson presiding. In addition to the presidential address and reports of officers of the Association, presentation of the J. H. Whiting Gold Medal of the American Foundrymen's Association will be made to A. L. Boegehold, chief metallurgist, General Motors Research Laboratories, Detroit, and the John A. Penton Gold Medal to John E. Galvin, president, Ohio Steel Foundry Co., Lima, Ohio, for outstanding contributions to the castings industry. In addition,

Dietert to Lecture on Core Practices and Theories

A FEATURE of the 1942 convention will be a continuation of the series of lectures on *"Modern Core Practices and Theories"* by Harry W. Dietert, president, Harry W. Dietert Co., Detroit, who is recognized, both nationally and internationally, as the leading authority on the control of sand mixtures in the foundry. Mr. Dietert began his series of lectures last year and the lecture course sessions were extremely well attended and developed a large amount of very interesting information of practical use to

H. W. Dietert

core room superintendents and foremen. Mr. Dietert will lecture at 4:30 each afternoon of the convention. The place where the lectures will be given may be ascertained from the program, which you will receive when you register at the convention.

So that the information developed for this lecture course may be recorded and used throughout the foundry industry, Mr. Dietert has prepared, in book form, the information contained in his lectures, plus a great deal of other information not contained in any textbook or manual. This book is being published under the title of "Modern Core Practices and Theories" and will be available on and after the first day of the convention.

Patrick Dwyer, engineering editor, *The Foundry*, Cleveland, Ohio, and Roy M. Allen, consulting metallurgical engineer, Bloomfield, N. J., will be presented with Honorary Life memberships in the Association for meritorious service to the foundry industry and the Association. Following the presentation of these awards, the annual Board of Awards address will be given by an outstanding speaker on world events.

Annual Dinner

The annual dinner of the American Foundrymen's Association will be held at 7:00 p. m., Thursday, April 23, in Hotel Cleveland. The speaker will be Dr. Preston Bradley of The Peoples Church of Chicago, an excellent speaker who will have a message of inspiration for those attending. The entertainment following the dinner will be sponsored by the Northeastern Ohio chapter, whose committee under the direction of Messrs. Leon Miller and Walter Seelbach, promises dancing and special events, including some surprises, which no one will wish to miss.

Ladies' Entertainment

An excellent program of entertainment for ladies of members and guests will be provided. The ladies' entertainment program will be under the direction of Sterling Farmer as general chairman and Mrs. J. Tuscany as chairman. The ladies' entertainment program is listed elsewhere in this issue.

Committees Report on Cupola Research Project

The Cleveland Convention will be the first opportunity offered to the Cupola Research Committee to present to the members of

D. F. Lane (left), Author of Apprentice Training Paper, and K. V. Wheeler, Co-Chairman, Steel Session.

Chairman Steel Luncheon R. S. Munson (left) and Author of Steel Paper A. B. Smith

the Association for discussion, progress reports of its many subcommittees. The general Cupola Research Committee has this past year been devoting its efforts to reviewing the known and best established theories and practices of cupola operation. Some of these findings, as prepared by recognized authorities who have been working as members of the committee, will be presented for discussion at a session, scheduled for Thursday afternoon.

Donald J. Reese, International Nickel Co., Inc., New York City, general chairman of the Cupola Research Committee, has been directing this work through a Steering Committee, the personnel of which, in addition to Mr. Reese, includes Max Kuniansky, Lynchburg Foundry Co., Lynchburg, Va.; S. C. Massari, Association of Manufacturers of Chilled Car Wheels, Chicago; John Lowe, Battelle Memorial Institute, Columbus, Ohio, and R. G. McElwee, Vanadium Corporation of America, Detroit, Mich.

The general committee, composed of over 80 members, is divided into seven subcommittees as follows:

Subcommittee on Equipment: *Chairman*, James Thomson, Continental Roll & Steel Foundry Co., East Chicago, Ind. *Vice-Chairman*, W. R. Jennings, John Deere Tractor Works, Waterloo,

J. F. Oesterle (left) and S. E. Mueller, Co-Authors, Steel Paper.

Iowa. *Secretary,* A. DeYoung, Whiting Corp., Harvey, Ill.

Subcommittee on Ferrous Materials and Alloys: *Chairman,* R. G. McElwee, Vanadium Corporation of America, Detroit, Michigan.

Subcommittee on Pig Iron: *Chairman,* T. G. Johnston, Pig Iron Division, Republic Steel Corp., Cleveland, Ohio.

Subcommittee on Scrap: *Chairman,* Max Kuniansky, Lynchburg Foundry Company, Lynchburg, Virginia.

Subcommittee on Alloys: *Chairman,* R. G. McElwee, Vanadium Corporation of America.

Subcommittee on Slags, Fluxes and Desulphurizers: *Chairman,* G. S. Evans, Mathieson Alkali Works, New York.

Subcommittee on Fuels and Combustion: *Chairman,* S. C. Massari, Association of Manufacturers of Chilled Car Wheels, Chicago.

Subcommittee on Operation and Process: *Chairman,* G. P. Phillips, International Harvester Co., Chicago. *Vice-Chairman,* H. Kenneth Briggs, Miller & Co., Chicago.

Subcommittee on Refractories: *Chairman,* C. S. Reed, Jr., Chicago Retort and Fire Brick Co., Chicago.

The general plan of the committee's efforts is to—

(a) Review published literature on cupola practice (this section has been completed through the cooperation of Battelle Memorial Institute.)

(b) Prepare and publish handbook on Cupola Practice and Theories (this work is being carried on at the present time by the committee.)

(c) Determine what research projects are most necessary to secure complete knowledge of unknown or unverified phases of cupola operation and then through organized research efforts endeavor to secure authoritative information on these problems.

Inasmuch as this cupola research project will entail the raising and spending of funds to complete this work, the Board of Directors of the Association has approved the raising of funds for this activity. The raising of funds for this project is under the supervision of a committee headed by George S. Evans, Mathieson Alkali Works. A good start has already been made by this committee, which is raising its contributions on a 5-year project basis.

Members—Bring Preprints to Convention

IN THE interest of paper conservation, you are asked to bring copies of preprints that you wish to discuss to the Convention with you. This request is made to avoid duplication of papers' distribution to members, thereby conserving paper. Additional copies of papers, however, will be sold at the Convention and may be purchased at the Convention Publication Booth. Non-members may purchase papers at the same location. NO PAPERS WILL BE DISTRIBUTED AT CONVENTION SESSIONS.

Sessions and Luncheons Scheduled for Statler

FOR the information of those members who will attend the 1942 Annual Convention and Foundry and Allied Industries Show of the American Foundrymen's Association, the following evening sessions and round tables are scheduled for the Statler Hotel, Cleveland. All other sessions will be held at the Cleveland Public Auditorium.

Monday, April 20
5:30 P. M. Reception of Central and South American Guests
8:00 P. M. Western Hemisphere Foundry Conference
8:00 P. M. Patternmaking Session

Tuesday, April 21
12:30 P. M. Non-Ferrous Division Round-Table Luncheon
12:30 P. M. Malleable Division Luncheon
6:30 P. M. Annual Apprentice Instructors' Dinner
6:30 P. M. Foreman Training Group, Dinner and Discussion
8:00 P. M. Refractories Session

Wednesday, April 22
6:30 P. M. Chapter Officers' Dinner
6:30 P. M. Annual Engineering Foundry Instructors' Dinner
8:00 P. M. Job Evaluation and Time Study Session
8:00 P. M. Engineering Training Session
8:00 P. M. Sand Research Session
8:00 P. M. Steel Division Session

Thursday, April 23
12:30 P. M. Steel Division Round-Table Luncheon

Old Timers to Renew Acquaintanceship

HEADQUARTERS for those who have 25 or more years of service in the foundry industry will be established at the North Exhibit Hall in an A.F.A. booth. A committee of "Old Timers" will be on hand to welcome fellow "Old Timers." This committee will be headed by Ben D. Fuller, Cleveland, a past president of the A.F.A. Serving with him will be T. C. Flinn, New York City; P. T. (Cap) Bancroft, Moline, Ill.; C. J. Miller, Fremont, Ohio; R. E. Wendt, Lafayette, Ind., and Henry Oehling, Cleveland, Ohio.

Service Buttons to Be Awarded

All those who register in the "Old Timers" book at this booth will be given service buttons, a 25-year button for those having served from 25 to 50 years, and a 50-year button for those whose service is 50 or more years.

This booth proved especially interesting to those present at the 1940 Exhibit Convention, when over 900 registered and greeted old friends.

Drilling a cast aluminum airplane crankcase.

Ladies' Entertainment Committee, Vice-Chairmen

Mrs. R. F. Lincoln

Mrs. Sterling Farmer

Mrs. F. J. Dost

Mrs. F. G. Steinebach

Mrs. J. W. Lathrop

Mrs. J. H. Tressler

Interesting Ladies' Entertainment Program Planned for Convention

THE Northeastern Ohio chapter, anticipating that a large number of ladies will accompany their husbands to the annual convention, has appointed a Ladies' Entertainment Committee, which has planned an extensive program of events. Ladies' registration headquarters will be the Hotel Cleveland. The tentative program is as follows:

Monday, April 20 — A.F.A. Tea, Hotel Cleveland.

Tuesday, April 21—Luncheon and Style Show, Higbee Tea Room.

Wednesday, April 22—Dinner and Theater Party.

Thursday, April 23—Visit to Studio of Radio Station WTAM.

The Ladies' Committee is under the general chairmanship of Sterling Farmer, director, Northeastern Ohio chapter. The personnel of the ladies' general committee is as follows:

Chairman, MRS. A. J. TUSCANY.

Vice Chairmen, MRS. STERLING FARMER, MRS. J. W. LATHROP, MRS. R. F. LINCOLN, MRS. FRANK G. STEINEBACH, MRS. J. H. TRESSLER, MRS. FRANK J. DOST.

MRS. C. M. BEATTIE, MRS. C. W. BRIGGS, MRS. HOMER BRITTON, MRS. J. H. BRUCE, MRS. H. A. BYRNS, MRS. A. C. DENNISON, MRS. W. J. FETH, MRS. F. RAY FLEIG, MRS. B. D. FULLER, MRS. W. E. GOEBERT, MRS. JAMES G. GOLDIE, MRS. E. J. HEDLUND, MRS. E. F. HESS, MRS. H. S. HERSEY, MRS. C. E. HILKERT, MRS. RALPH W. HISEY, MRS. J. WILLIAM HORAN, MRS. T. G. JOHNSTON, MRS. WALTER O. LARSON, MRS. W. C. MANWELL, MRS. HARVEY MARETTE, MRS. H. L. MCKINNON, MRS. J. H. REDHEAD, MRS. HARRY SCHWARTZ, MRS. CHARLES SEELBACH, MRS. W. C. SLY, MRS. W. G. SMITH, MRS. FRED A. STEWART, MRS. M. G. THOMAS, MRS. S. C. VESSY, MRS. R. H. WEST, MRS. J. J. WITENHAFER and MRS. M. W. ZEMAN.

Mrs. A. J. Tuscany (left), Chairman, and Sterling Farmer, General Chairman, Ladies' Entertainment Committee.

The tea party on Monday, April 20, will be in charge of Vice Chairmen Mrs. Frank J. Dost and Mrs. J. H. Tressler. On Tuesday, April 21, Vice Chairmen Mrs. Frank G. Steinebach and Mrs. J. W. Lathrop will be in charge of the style show and luncheon. The theater party and dinner on Wednesday, April 22, is to be in charge of Vice Chairmen Mrs. J. H. Tressler and Mrs. R. F. Lincoln. Vice Chairman Mrs. Sterling Farmer will be in charge of the groups visiting the WTAM radio station studio in the NBC Building. Mrs. A. J. Tuscany will have charge of the ladies' activities at the annual dinner and dance to be held Thursday evening.

Reichert to Lecture on Sand Control

W. G. REICHERT, general foundry metallurgist, American Brake Shoe & Foundry Co., Mahwah, N. J., will feature the annual sand shop course at the 1942 convention. Mr. Reichert will discuss fundamentals of sand control.

The lecturer is eminently fitted to discuss his subject. He has control of sand in over 40 foundries operated by his company and its subsidiaries. These foundries include those manufacturing steel, gray iron and non-ferrous castings. Mr. Reichert has been interested in sand problems for many years and has contributed some outstanding work to our present knowledge of the properties of foundry sand. He is a member of many A.F.A. committees, including the Executive Committee of the Foundry Sand Research Committee, is chairman of its important Subcommittee on Grading and Fineness and a member of its Subcommittee on Physical Properties of Steel Foundry Sands at Elevated Temperatures.

W. G. Reichert

Some of the subjects on which Mr. Reichert has presented papers are those on casting surface and more recently a paper on the present status of foundry sand investigation and control.

Special Speakers to Feature Several Convention Sessions

IN keeping with the war-time objectives of the 1942 convention, special war production sessions will be held, at which outstanding men who are directing various phases of the war effort in several localities will be the speakers. These sessions are scheduled for 10 a. m. Monday and 11:45 a. m. on Tuesday, Thursday and 11 a. m. on Wednesday of Annual Foundrymen's Week.

In view of the national importance of the 1942 convention to the foundry industry, it is fitting and proper that the opening session should be addressed by a man responsible for huge expenditures for armament in a leading production center. Col. H. M. Reedall, Deputy District Chief, Cleveland Ordnance District, Cleveland, Ohio, with whom your Association has co-operated practically since the time when this all-out war effort convention was in its formative stages, will speak at the opening meeting. Col. Reedall is very familiar with the foundry industry and the ever-increasing part that castings are playing in our war effort. His engineering training, prior to his entrance into the Army as a private in 1917, partially accounts for this knowledge. Following service in France during World War 1, he entered the Massachusetts Institute of Technology, from which he was graduated in engineering, and his later attendance at the Army Industrial College, Washington, D. C., further increased his engineering knowledge.

At the special war production session on Tuesday, the Association has been fortunate in securing Rear Admiral George W. Pettengill, Commandant and Superintendent, U. S. Navy Gun Factory, Washington, D. C., as speaker. As Commandant of the Washington Navy Yard, Admiral Pettengill has under his command some of the outstanding foundry facilities in the Navy Department. At present, these facilities are being used as pilot plants to work out the difficulties encountered in the production of Navy castings and pass the methods of overcoming them on to foundries engaged in Navy work. This work is being carried on in addition to regular production work for the Navy.

Rear Admiral G. W. Pettengill

The speaker at the Thursday special war production session needs no introduction. W. F. Patterson, Chief, Federal Committee on Apprenticeship, Washington, D. C., has been a speaker at several of the conventions of your Association. His wide experience of knowledge of apprentice training of all types is well known to the foundry industry. Now that we are engaged in a war, the demand for skilled workers has increased immeasurably. It is a question as to how we can train the most men the quickest. In his talk, Mr. Patterson will discuss various training problems.

Awards Lecture

The annual Board of Awards lecture to be presented at the annual business meeting at 10:00 a. m., Wednesday, April 22, will be given by Rear Admiral Clark H. Woodward, U.S.N., Retd., Assistant Director, Civilian Defense, Navy Department Member, Board of Civilian Protection, Office of Civilian Defense, Washington, D. C. Admiral Woodward will discuss measures to protect life, property and production facilities during war.

Annual Dinner Speaker

At practically every annual dinner, the Association has been fortunate in securing a speaker of outstanding brilliance. This year is no exception. Your Association has been fortunate in securing Dr. Preston Bradley, Peoples Church of Chicago, to deliver the dinner address. Dr. Bradley needs no introduction to many who will attend.

Rear Admiral C. H. Woodward

W. F. Patterson

Dr. Preston Bradley

Col. H. M. Reedall

Castings in Industry -- Reviewing Their Application During Peace and War

By H. S. Simpson,* Chicago, Ill.

This paper was delivered at the General Assembly, Eighteenth Annual Conference of the Iron, Steel and Allied Industries, Del Monte, Calif., February 13, 1942, by the author. Its content is interesting and is a general report of the castings industry explaining how the four fields of metals, steel, malleable, gray iron and non-ferrous have been improved both from the material and physical standpoint. This improvement is greatly appreciated when one considers these cast metals as they appeared a few years back.

So many things are happening these days that it is difficult to project ourselves very far ahead. However there is one thing we know for certain, and that is America will win this war.

Some of the main reasons for our victory are the help and assistance that will be given to our Government and our armed forces by all branches of industry. Industries that have to do with developing our efforts toward a victorious result.

Importance of Industry

While industry has always been important in this country, it was never more so than at present. Consequently I am naturally proud of the opportunity of representing nearly 5,000 members of the foundry and allied industries which I believe are essential to production of many things we need to put the United States in a position where she will be, in co-operation with our allies, more powerful than any combination of opposing nations that are trying to break down our democratic form of government.

Castings are playing a very important part and will continue to do so not only as long as this war lasts but when peace comes will serve many purposes that are necessary to maintain our standard of living.

From an early prehistoric time, castings have been fundamental to man's progress and civilization. With the development of what is called the industrial age, castings have constituted a basic foundation for the development of mechanical processes, as well as some of the less mechanical phases of life. Today, with all attention being directed toward war efforts, the casting industry is being called upon most heavily to the end that production may meet pressing needs, in indirect as well as direct manufacture of armament and accessory equipment and supplies.

We realize that because the industry is such an old one that it is often taken as a matter of course and more publicity is given to some newer developments of processes for producing equipment and parts. This may be due to a fault of ours in being too modest, and also to the fact that cast parts are not always sold to the public as castings but as essential parts of automobiles, tractors, bath tubs, heating plants, printing presses, and thousands of machines used daily.

Castings Make Progress

It is a fact that during the past 25 years more progress has been made in the castings field than was made before that time. This, perhaps, was partly due to the stimulus of competition from other products. Like all human beings, the foundryman is prone to go along on traditional lines, but when prodded by competition he sets to work and has shown what can be done.

Some of us are familiar with the publicity given to a statement made by one of our most famous automobile manufacturers when some 15 years ago he said that shortly there would be no castings in his car. Today that car has a larger percentage of castings than when the statement was made. Also parts are now made of castings which at that time very few foundrymen thought could be cast, for instance, the crank shaft, the camshaft, and the brake drum.

New Developments

Developments in strength, wear resistance, corrosion resistance, machinability, economy of production, all have come about through scientific research. A similar study has been made of the use of alloys, heat treatment, melting methods, composition control, sand control and treatment, and mechanical production methods, together with more attention given to the proper designing of castings.

We who are connected with the foundry industry have every reason to be proud of its record, producing castings over the centuries for man's use. We are justly proud of its history, its place in art, in the home, in industry and in war, in its craftsmanship and its developments in production methods.

Historically, the foundry is one of the oldest of crafts, dating back to prehistoric times. Centuries before King Solomon had his master craftsman, Hiram of Tyre, cast tubs, shovels and basins in brass in the clay ground between Succoth and Zartham for the temple, the permanent mold process for casting bronze spear and axe heads was known in the Mediterranean district. About the same time (3000 B.C.) castings of bronze and brass were made in China.

*President, American Foundrymen's Association and, President, National Engineering Co.

While brass and bronze castings were the earliest produced, it is extremely interesting to note that China produced iron castings, recorded as early as 513 B.C., with indications that there was nothing new or novel about them at that time. These iron castings and the early bronze castings were largely used for home utensils and religious objects. What is said to be the largest iron casting (in bulk) ever made, an image of a lion, dated 953 A.D. is still standing in the yard of a Chinese monastery. This iron casting is 20 ft. high, 16 ft. long, with a metal thickness of 1½ to 8-in. It is truly a monumental piece of work, especially considering the crude furnaces and equipment then available.

Use of Castings

In medieval times, the founder was called upon to produce guns; brass and iron being used. Many of these cannons, some very large, are in existence today, showing the part the foundryman played in land and sea warfare. Today, while cannon are largely forged, yet importance has recently been attached to the centrifugal process for making cast steel guns, while castings in profusion are used for navy vessels and in ordnance work. For instance, tanks are being designed with steel casting hulls to take advantage of shapes and construction to provide greater safety for the crews. Cast bombs and shells are finding a place because of their worth and for ease of production in great quantities.

Speaking of steel castings, brings up another point. While brass, bronze and iron were the main source of castings in the old days, the foundryman has now at his command the newer metals. Steel was first cast in this country about 1867. Alminum and magnesium were introduced in the early years of the 20th century through the scientific development of means to reduce these metals from their ores and making them available in commercial abundance. These metals were offered to the foundryman for castings which required lightness, strength and ease of working—properties inherent in these metals. We must mention one metal used only by foundries for producing castings, namely, malleable cast iron. Used extensively for automotive parts and railway construction, it has great strength, very malleable, easily machined and very economical to produce.

Early Founders

One field of castings, generally not recognized by the public is that castings are fundamental in art. From earliest times the sculptor and the artist have used the casting process. Religious and secular art pieces of most beautiful statuary and ornamental parts for buildings are a tribute to the craftsmanship of the founder. Bronze statues have been made for centuries, as has cast jewelry of gold, silver and bronze.

Pausanias, a Greek, speaks of "Theodorus the Samian (sixth century B.C.) who invented the means of pouring iron as well as to fabricate statues from it." He also speaks of the statues of the iron throne of Pindar, of a statue of Hercules, a head of a lion and a wild boar of iron. Cellini, most famous of early artists was himself a master foundryman and his most noted piece of art, a "Salt Cellar," was cast by him in gold.

Today, outstanding examples of artistic work are in the Field Museum of Chicago, in "The Hall of Man," consisting of numerous statues made by Malvina Hoffman. Time does not permit me to go into detail discussing the art products of the foundry, such as the grill work of iron on buildings, decorative panels and stair rails.

Confining ourselves now to the utilitarian, we want to mention the place of castings in several of the main industrial fields. The automotive companies are the largest foundry operators. Such things as cylinder blocks, pistons, cylinder heads, fly wheels and many other parts best fill the requirements and economical production features demanded by the modern automobile. The modern car could not have been possible without foundry research developing better cast metals in the foundry, definitely assisted by foundry equipment manufacturers who developed means for turning out castings in great quantities. Improvements demanded by the automobile have aided the foundryman to meet similar demands in other industries, the oil industry being a good example, where needs for heat and pressure resistance in valves and fittings have increased tremendously. Here alloy steel castings have played their part.

The printing industry has also demanded much of the founder in producing more and more intricate frames, rolls and parts. The chilled cast iron wheel for railway cars, is a distinct foundry industry where the foundryman and metallurgist has improved his product to meet ever stricter specifications of the

Shaking out castings that will play a part in our war effort.

Charging a heat treating furnace.

American Railway Association. The railway industry is dependent on the founder for brass, bronze, steel, malleable and iron castings for cylinders, couplers, side frames, injectors, pistons and numerous other parts.

Castings in the Holland Tunnel

The great Holland Tunnel under the Hudson River in New York City is lined with castings, each 2½ ft. wide, 6 ft. long and weighing approximately 1½ tons, the total weight being somewhere around 115,000 tons. One of the older uses of castings, that of pipe for water and sewerage, has today developed into one of the most important industries. Cast iron pipe for the service rendered has proved its worth in corrosion resistance, strength and economy. For long life, cast iron pipe laid in the year 1562 continues to supply the famous Jacobie and Rothaus fountains, is a splendid example.

Two other industries, depending on foundries, which have made great improvement in casting properties are, first, the sanitary ware manufacturers whose names are known to every household in the country; and second, the machine tool industry, of which the foundry is a basic part. Machine tool manufacturers find that castings offer the best process for fabricating lathe beds, milling machine beds and frames, drill presses and other parts, taking advantage of alloy developments, heat treatment and production methods which give better castings, meeting higher requirements as compared to a few years ago.

Floating foundries provide repairs for the U. S. Navy. Keeping battleships, cruisers, and other fighting craft in operation is a big essential job for the Navy. The foundry has an important place in this work, for though the Navy has some of the largest foundries of the world at its Navy Yards for new construction and major repairs, it also has on some of its repair ships, foundries to make parts for repairs at sea, one is equipped to handle a wide variety of castings in ferrous and non-ferrous metals. The shop is located below the water line and follows the most up-to-date practice. But, of course, in the great majority of its requirements, the Navy depends upon industry to supply castings of all kinds.

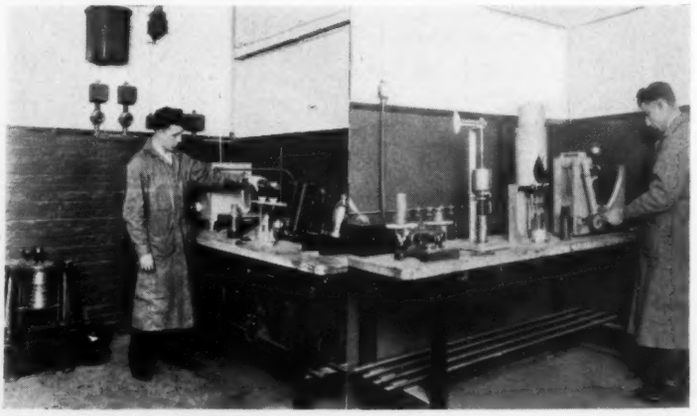
The British are as proud of their "Queen Mary" as the French were of the "Normandie," now the "Lafayette," both giants of the sea. Equally so the foundry industry is rightfully proud of these queens of the ocean for castings of all types are useful parts of these ships, as they are of all other ships. While driven by cast cylinders and pistons, the giant propellors are huge gems of the foundry art. The propellers of the Queen Mary each weigh 81,760 lb. while on the former Normandie each of the propellors weigh 59,400 lb. These propellors are cast in one piece of manganese bronze, and have the strength and resistance to salt water corrosion that makes them best suited to drive the ships through the seas. Speaking of ships and particularly submarines which depend so much upon Diesel engines, it is, of course, proper to comment on the large number of castings used for the Diesel power plant.

Lighthouse Uses Castings

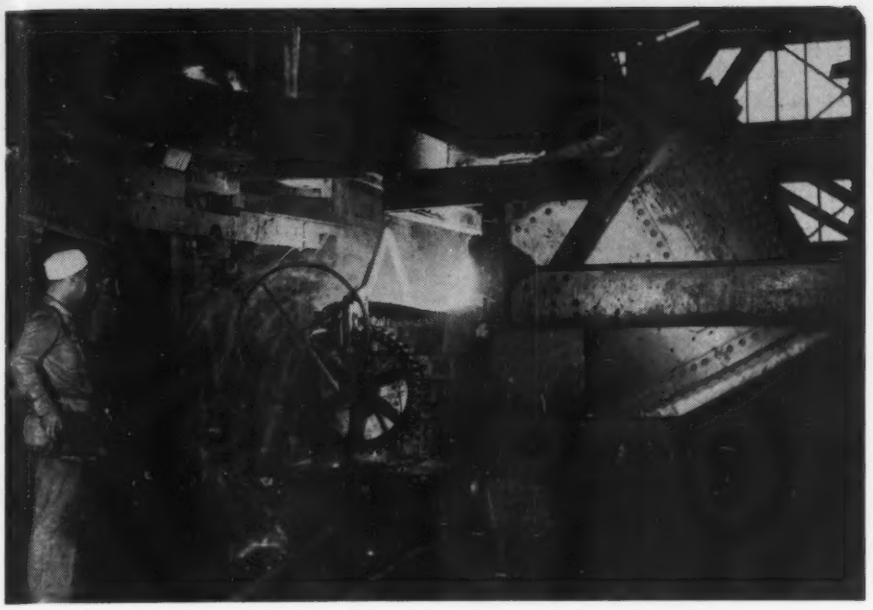
Incidentally, the Cape Henry, Virginia, lighthouse on December 15, 1941, completed 60 years of service. It has stood up against the heaviest Atlantic storms and resisted the corrosive action of salt water because of the cast plates which form the outside shell of the lighthouse.

In foregoing and other fields, the casting process lends itself to the formation of intricate, integral parts, with strength and rigidity not easily obtainable by any other method of fabrication. The field for cast parts is increasing constantly due to increased co-operation between the designer and foundryman. New applications and adaptations are found which previously were considered outside the scope of the casting industry.

In the past few years, cast metals of greatly improved strength, wear, corrosion and heat resistance, machinability, toughness or hardness, have been developed in each group of casting alloys. A comparison of the present specifications for mechanical properties offered by producers of steel, gray iron, malleable iron and non-ferrous castings with those offered a few years ago, will prove a revelation to those who have not made a close study of the progress that has been made by the foundry industry. By co-operation with



Laboratory technicians whose research on foundry problems have brought forth many valuable discoveries.



Tapping a furnace that means metal for our war needs.

your foundry supplier in the proper selection of the right type or grade of cast metal, correct heat treatment and careful foundry and metallurgical control, castings of uniformly high quality, covering a wide range of physical properties, it is possible to satisfy requirements at a cost which no other process can meet.

The designer or purchaser of a casting should not be interested so much in the cost per pound of the casting as he is in the over-all cost of the finished part which will best suit his requirements. A decrease in cost often may be accomplished by a decrease in weight, obtained by proper designing, proper selection of casting material, proper pattern equipment and heat treatment. In other cases, the choice of proper design may even mean slight increases in weight of casting but a lower overall cost. Through increased co-operation between the designer, foundry and metallurgical engineer, in the selection of the cast metal and in the formation of proper casting designs, better stronger castings often may be obtained without the penalty of high production costs that accompany castings of poorly specified material or faulty design.

A determined effort over the last few years has been initiated to impress upon the engineer designer, the need for realizing the possibilities of the most recent, tremendous developments, in casting qualities. This has been brought about by research in alloy use, heat treatment and production methods.

Directional Solidification

Another point for the designer is to realize that the casting of metal is a metallurgical process and that the metal on solidifying follows certain laws, the principle of which is "directional solidification". In other words, metal freezes from the outside first, with the center the last to solidify and that smaller sections freeze before the heavier. When properly designed to take care of this directional solidification, castings can be made with the least amount of metal, yet give the best strength and solidity. Consultation with the foundryman will show how the part can be designed for best production.

Just a word about specifications. The user is interested primarily in getting parts to fill his requirements. The Federal specifications, used by the U. S. Army and Navy, and the specifications of the American Society for Testing Materials, are now recognized as those most universally used. The American Foundrymen's Association is cooperating with the American Society for Testing Materials which is, in turn, working closely with Federal specification making bodies to get the best results.

One chief objection to many of the specifications made by individual consumers is that they often try to insist on determining not only the properties of castings being what they want, which is the real object of a specification, but some also insist on specifying how the part is to be made and the composition used. We know quite definitely that there are many good ways of making a part, each to give a similar result, but compositions to obtain the desired properties should be left to the foundryman. The foundryman knows best what compositions to use in order to meet the requirements of the specifications. Often, incorrectly tying properties and composition together in a specification will defeat the purchaser's main object, viz., to obtain a casting with properties to meet his requirements. Co-operation between the designer and the foundryman pays big dividends and will give the designer or purchaser what he should have for his needs. Insistence on unwise or impractical specifications means added costs which ultimately must be borne by the purchaser.

From 1645, when we are told that the first American iron casting was poured, at Lynn, Mass., and continuing throughout the spectacular rise of industry to the present time, the skill, organization and resources of the foundry industry have contributed to every noteworthy engineering accomplishment.

Every great American invention owes something to the service of cast parts. The Yankee sewing machine, favored in every civilized country in the world, is essentially an assembly of cast parts. Agricultural equipment, typewriters, cash registers, automobiles, refrigerators, electrical and heating units, and many other products which have carried the fame of American ingenuity in design and production to every corner of the globe, depend to a large degree for their low cost and efficiency of opera-

tion on the contributions of the foundry industry.

Today, with this impressive background of many years of uninterrupted service to industry, American foundrymen are in a better position than ever before to meet the everchanging requirements of industry. Their products embody recently enhanced knowledge of metallurgy, improved foundry practice and mature experience in adapting castings to the customers' needs to a degree never before possible.

Castings Range In Application and Properties

The American foundry industry now offers manufacturers of machinery and engineering equipment a range of materials of great diversity in properties and useful application. Its products of iron, steel, and non-ferrous metals and alloys, cast centrifugally, by gravity or by pressure, in sand or metal molds or in dies, find application in every avenue of engineering activity. Their properties, running the full range from softness, extreme ductility and machinability, to flint hardness, stiffness and resistant to abrasion; with a wide range in tensile, compression and shearing strengths, and having almost any desired chemical analysis, make cast parts adaptable to broader application in engineering construction than ever before.

In these days of a united America, our thoughts naturally turn toward, first, the Liberty Bell, a cast bronze product; and second, the dome of our nation's capitol which has 36 cast iron columns, each weighing 10,000 lb. and the dome covered by cast iron plates; with the Liberty Bell as the emblem of our freedom, and the most famous product of American castings.

It is my sincere belief that castings have contributed definitely to American progress and will continue to do their full share in helping us maintain our freedom, which we must always guard with all our wealth, our energies, and our very lives.

Standard Specification for 88-8-4 Alloy Castings

THIS standard specification for castings of the alloy: copper 88 per cent, 8 per cent tin and 4 per cent zinc, bears the A.S.T.M. designation B60-41. These specifications cover alloy castings intended for use in pressure-containing parts, suitable for application in expansion joints, pipe fittings, valves, pump parts, and similar parts where tightness under hydrostatic pressure, resistance to certain types of corrosion (such as salt water), wear resistance and good strength are required.

According to the specifications the alloy should conform to the chemical composition shown in Fig. 1.

	Minimum	Desired	Maximum
Copper, per cent	86.00	88.00	89.00
Tin, per cent	7.50	8.00	11.00
Lead, per cent	....	none	0.30
Zinc, per cent	1.50	4.00	4.50
Iron, per cent	....	....	0.25
Nickel, per cent	....	....	1.00
Phosphorus, per cent	....	....	0.05

Fig. 1—The minimum, desired and maximum requirements for 88-8-4 copper alloy.

Also listed are the minimum properties to which this alloy is to conform:

Tensile strength, min., psi..38,000
Yield point, min., psi.....16,000
Elongation in 2-in., min., per cent 22

Test Specimens

The test specimen coupons should be cast to the form and dimensions shown in Fig. 2, and they shall not be chilled. The fingate along the side should not be less than 5/16-in. in thickness at any point along its length. Figure 3 shows the form and dimensions of the tension test specimens.

Number of Tests

In this specification, the manufacturer must prepare and furnish all test bars and each casting weighing 250 lb. or more shall have at least one test bar

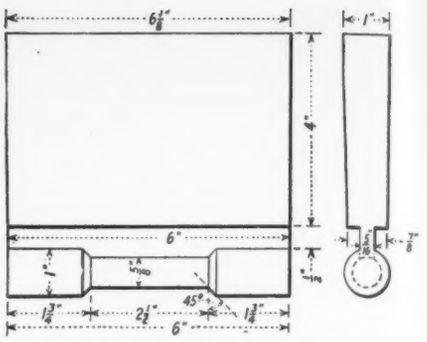
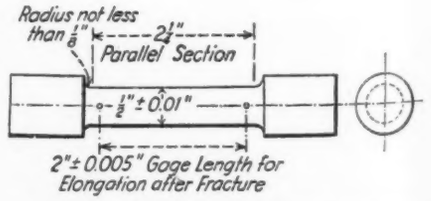


Fig. 2—Test specimen coupon.

attached, while castings weighing less than 250 lb. each shall have at least one test bar and be attached to one or more castings from each melt, if practical. Provision is made for bars to be cast separately in sand if found not practical to attach to the casting. Replacement of test bar due to defects found when machining is provided for in this specification.

The requirements for workmanship, finish, inspection and marking are much the same as those for other A.S.T.M. specifications. An interesting sidelight is that upon request of the purchaser, the manufacturer must be prepared to certify that his product conforms to the requirements of this specification if the product is ordered under it.

Full details of this specification have been issued under the title *"Standard Specifications for Castings of the Alloy: Copper 88 per Cent, Tin 8 per Cent, Zinc 4 per Cent,"* A.S.T.M. Designation B 60-41, and may be obtained either from the offices of your Association, 222 W. Adams St., Chicago, Ill., or from the American Society of Testing Materials, 260 S. Broad St., Philadelphia, Pa., for a nominal fee.



Note:—The gage length, parallel section, and fillets shall be as shown, but the ends may be of any shape to fit the holders of the testing machine in such a way that the load shall be axial.

Fig. 3—Standard 2-in. gauge length tension test specimen.

Castings Publicity and Industry Responsibility

In the December 15 issue of the magazine "Time," page 47, there appeared a paragraph extolling the value of welding over casting. The statements made in this article referred to machine tools. The article was brought to the attention of your National office and the editors of "Time" were apprised of the fact that they had been misinformed. As a result of bringing the statements contained in the article to the attention of the editors of "Time," they delved into the matter more thoroughly and in the March 16 issue of the same magazine, pp. 73 and 74, printed an article entitled "Castings vs. Forging." In this article, the statement is made that cast steel armor plate is considered a technological shift "little short of a revolution" by engineers and further paid tribute to the part which castings are playing in the National Offense program. They cite particularly the application of cast products in army material.

With permission of the editors of "Time," we reprint herewith their news item regarding castings:

> First, welding began to replace riveting in ship- and plane-building (Time, Dec. 15). Now cast steel is replacing forged steel, and in tanks it is replacing both riveted and welded armor plate. Engineers call this technological shift "little short of a revolution."
>
> Said Ford's chief metallurgist, Russell H. McCarroll, last week: "By making an airplane cylinder barrel as a centrifugal casting instead of a forging, we helped break all four of the main bottlenecks in production: materials, time, skilled manpower and machine tools."
>
> **Pound or Pour?** Sample military gadget is a machine-gun trunnion block, on which the gun swivels. When it is forged, i.e., pounded, into rough shape out of a hot chunk of steel, it weighs 20 lb. In machining the block into shape, 14 lb. of steel is drilled, planed and ground away before the crude lump becomes a finished 6-lb. trunnion block.
>
> If the same part is cast instead of forged, it weighs only 11 lb. before machining, because molten metal can be poured into nooks and crannies where no trip hammer can force it. So only 5 lb.—about one-third as much—of steel remain to be tooled away. Result: a 35 per cent saving in skilled man-hours (according to metallurgist Carl F. Joseph of General Motors), plus a corresponding 35 per cent increase in the capacity of machine tools.
>
> Castings began to replace forgings on a big scale in 1932 when Ford first poured V-8 crankshafts instead of hammering them. Since then, 10,000,000 Ford crankshafts have been cast with such success that many another part is made in the same way. But the trend toward casting did not get up real speed until many foundrymen last year began to fear that war contracts, escorted by priorities, would pass them by without a nod.
>
> Abolition of the automobile industry might well have closed down a midwestern auto specialties plant had not this foundry begun casting 60-mm. U.S. and 3-in. British mortar shells, a practice unthinkable in World War No. 1. Mortar shells must be of precise dimensions and exacting metallic analysis so they will burst into fragments not too large and not too small to insure maximum bloodshed. Hence, they had always been forged, and many an ordnance officer swore they couldn't be cast: cast steel is full of pores and bubbles, it shrinks in its molds to nonuniform sizes, its metallic structure is unreliable.
>
> All this was true—in 1918. But the metallurgist's laboratory, now equipped with such things as powerful X-ray machines to study flaws in castings, has replaced the foundry foreman's rule-of-thumb. Says Detroit metallurgist E. C. Troy, "The foundry engineer has been able to improve his product almost beyond recognition."
>
> **Spinning Guns.** "The U.S. today leads the world in the science of gun-making," says Brigadier General Rolland W. Case, Commandant of the Watertown (Mass.) Arsenal, and he gives most of the credit to replacement since 1918 of forging by centrifugal steel castings.* Steel for cannon is poured into horizontal molds which whirl rapidly until the metal hardens. Impurities are forced to the hollow center of the barrel where they are easily bored away, and blowholes and shrinkages are avoided.
>
> "A single casting machine will turn out several gun tubes in the time it takes to forge one," says Case, and machining time is cut 25 to 40 per cent. "Reduction in weight is considerable," he adds, "and is used in many guns to regain mobility."
>
> Centrifugally cast cylinder barrels will be used in all of Ford's Pratt & Whitney engines by this month's end. Both Army and Pratt & Whitney engineers—mindful of the old cast-iron stove lid which was almost as brittle as glass—were leary of steel castings until Ford testers showed that, while forged barrels burst at 5,000 to 7,000 lb. per sq. in., centrifugally cast barrels burst at 9,000 to 10,000 lb. "Moreover," said a Ford engineer last week, "$10,000 worth of centrifugal dies will turn out as many cylinder barrel blanks as a $110,000 forging hammer." Landing gear for bombers is also centrifugally cast by Ford.
>
> **Armor.** Casting U.S. tank turrets and hulls, heretofore riveted or welded together from steel plate, gets rid of another traditional prejudice against cast steel: that it couldn't successfully be toughened by heating and quenching. About one-third of U.S. tanks are now built of cast armor and all of them would be, if foundry and machining facilities were adequate.
>
> The advantages of cast armor are that (1) there are no rivets, which a direct hit may drive into the interior of a tank, where they ricochet, as deadly as bullets, and (2) it allows a goodly weight saving by eliminating angle-pieces and overlapping necessary for riveting plates together. Unlike welded armor, cast armor has no seams of uncertain toughness. And, unlike both riveted and all-welded armor, cast armor can have rounded corners to deflect glancing shells.

***First used in the U. S. in 1902 in making railroad wheels at the American Steel Foundries plant in East St. Louis.**

The editors of "Time" have done a good job in discussing the contributions of certain branches of the foundry industry to the National Offense program. It is hoped that in the future they will familiarize themselves with the large part being played by the other divisions of the industry not mentioned in their article which contribute so many parts to the manufacture of machine tools, engines of all types, including airplane, trucks, ships, guns and an endless chain of parts.

Despite the fact that this article omits the contributions of some of the branches of the foundry industry to the National Offense program, let us remember that any publicity which refers to the contribution that castings are making toward winning this "war of production" is good publicity for the industry, irrespective of whether said publicity emphasizes one or another branch of the industry. The point is, it emphasizes the utility of cast products and, at least for a time, tends to focus the spotlight on the foundry industry.

This same publicity places a responsibility on the manufacturers of cast products. They must live up to the expectation of engineers in producing their product. To do this, foundries must have their processes and products under technical

(Continued on Page 26)

Twin City Chapter Challenges Membership Contest Leaders

WHILE there was no upset among the first five leaders in the National Membership contest during the past month, several chapters have made giant strides and begin to threaten. The largest single advance made by any chapter in its standing during the past month was made by St. Louis. This chapter, which held down the cellar position last month, jumped to 12th place by sending in 14 new memberships and converting two of its Personal memberships to Company memberships. Congratulations to St. Louis District Chapter for its fine showing.

Ontario Up Six Places

Another big jump was made by the Ontario Chapter which leaped up 6 places, from 13th last month to 7th this month. Twin City begins to threaten the leaders by advancing 6 places, from 12th to 6th. Southern California, which sent in the largest number of new memberships this month, 15, advanced from 16th to 11th place. We wonder if these 15 new memberships are just a warning to look out for what happened last year. At the 1941 convention, Southern California Chapter ran off with 3rd place when, on the last day of the contest, they sent in over 60 new memberships. Of course, some of the other chapters may have received ideas from Southern California's success last year.

The Detroit Chapter, which sent in the third largest number of new memberships this month, 12, has been advancing steadily in the contest. Not so long ago, Detroit was a minus quantity; in other words, it was in the hole. In January, Detroit occupied the cellar, in February, it jumped to 20th place, in March, it was in 18th place, this month, it is in 15th place. The Detroit Chapter is gradually going upward. With a month to go and with the large potential membership in that area, a stretch drive may be imminent.

With the chapters mentioned showing the progress that they have made, naturally some chapters have to suffer in standing. Central Indiana dropped from 6th to 8th place and Chicago from 7th to 9th. Metropolitan in 8th place last month now occupies 10th position, and Michiana in 9th place, now has dropped to 13th. Northeastern Ohio jumped nicely from 17th to 14th place. Northern California dropped from 10th to 16th, Western New York from 15th to 17th, while Central New York and Philadelphia held their own. Quad City dropped considerably, from 14th to 21st place, but the biggest drop was by the Birmingham District Chapter which fell from 11th place to the cellar. The reason for Birmingham's nose dive you ask? Delinquents—My boy—Delinquents. However, don't count Birmingham out. They probably will stage a come-back.

Chesapeake Gaining

Chesapeake did a swell job last year and ended in second place. They are pushing along steadily again and this month jumped two places, from 21st to 18th. We wonder if they, too, are playing possum.

You will remember that last month's report set a record for the year in new members obtained, 132 plus 3 conversions from Personal to Company memberships. We also pointed out last month that the chapters needed to obtain only 14 new memberships each for each of the following two months to reach the goal set by the National Membership Committee of "5000 for '42." It is interesting to note in the list of new members on the opposite page, in the 126 new members reported, that 17 of the 22 chapters are represented. Southern California sent in 15 new members to lead the parade, while the St. Louis District Chapter reported 14 new members and 2 conversions from Personal to Company memberships. The question now is who leads this month, or shall we call it a tie between Southern California and St. Louis? On the basis of points, it looks as though Southern California would have to be declared the winner because among the 15 memberships it sent in, 6 were Company memberships. The Detroit Chapter should be encouraged with its 3rd place this month with 12 new members, and that tough competitor, Wisconsin, is in 4th place this month, just one membership behind Detroit with 11.

Chapter Membership Progress Report

Chapter		Membership as of 7/1/41	Chapter Quotas	Gain in Membership as of 3/15/42	Chapter Standing By Points
1	Western Michigan	50	68	30	460
2	Toledo	43	60	22	360
3	Wisconsin	310	210	98	322
4	Nor. Illinois-Sou. Wisconsin	40	46	11	304
5	Cincinnati District	141	141	30	212
6	Twin City	66	84	21	177
7	Ontario	98	199	29	167
8	Central Indiana	127	111	19	166
9	Chicago	425	259	45	155
10	Metropolitan	172	210	32	149
11	Southern California	194	201	25	132
12	St. Louis District	135	90	12	127
13	Michiana	67	101	13	96
14	Northeastern Ohio	328	243	27	86
15	Detroit	231	196	15	79
16	Northern California	107	99	8	73
17	Western New York	151	111	9	70
18	Chesapeake	154	159	16	68
19	Central New York	109	90	3	47
20	Philadelphia	185	237	6	43
21	Quad City	129	41	1	8
22	Birmingham District	242	125	-16	-36
		3504		456	

While a chapter may show no increase in membership, it is possible to show a gain in the Chapter Standing by Points Column by converting a Personal to a Company membership or a Company to a Sustaining membership, since each class of membership carries a different credit in points.

The above figures do not include membership in non-chapter areas.

New Members

(February 16 to March 15, 1942)

The Southern California chapter took the offensive this month and came in with 15 new members. St. Louis, whom we warned you about last month, rang the bell 14 times, and Detroit, who is climbing fast, gathered 12. The 22 membership committees have been going full blast and the Association has grown much—thanks to them. For the entire list of new members shown below, the Association bids welcome and extends a most hearty invitation to take part in its activities.

Conversions

Company from Personal

Fry-Fulton Lumber Co., St. Louis, Mo. (James A. Roland, Secretary)
Fulton Iron Works Co., St. Louis, Mo. (Herman Harte, Foundry Supt.)

Birmingham District Chapter

R. W. Lowery, Lowery Printing Co., Birmingham, Ala.
*M & H Valve & Fittings Co., Anniston, Ala. (Chas. S. Martin, Pres. and Gen'l Mgr.)
*Rome Stove & Range Co., Rome, Ga. (A. F. Selman, Secretary-Treasurer)
C. A. Turner, Foreman, American Cast Iron Pipe Co., Birmingham, Ala.

Canadian Section

Wm. Duncan, Foundry Foreman, Pacific Mills Pulp & Paper Co., Ocean Falls, B. C.

Central Indiana Chapter

Ernest Albert Fuller, C. & G. Foundry & Pattern Works, Indianapolis, Ind.
Richard C. Krug, International Harvester Co., Indianapolis, Ind.

Chesapeake Chapter

C. G. Chevalier, Baltimore, Md., Agent, North East Fire Brick Co., North East, Md.
Alvin G. Clark, Partner, Charles C. Clark & Sons, Baltimore, Md.
Edward Coscia, Appr., Crown Cork & Seal Co., Baltimore, Md.
T. W. Curry, Fdry. Engr., York Ice Machinery Corp., York, Pa.
Louis J. Iadarola, York Ice Machinery Corp., York, Pennsylvania
Michael James Kelly, Owner, Kelco Manufacturing Co., Baltimore, Md.
James E. McAleer, McShane Bell Foundry Co., Baltimore, Md.
Jerome Petr, Appr., Crown Cork & Seal Co., Baltimore, Md.

Chicago Chapter

Burton E. Eleder, Foreman, Link-Belt Co., Chicago, Illinois
Henry S. Mathers, Foreman, Coreroom, American Steel Foundries, Indiana Harbor, Ind.
C. McKelvey, Chicago Hardware Foundry Co., North Chicago, Ill.
John J. Pauly, Appr., Nichol-Straight Foundry Co., Chicago, Ill.
Walter Polek, Molder, Hills-McCanna Co., Chicago, Illinois
John A. Rassenfoss, Research Met., American Steel Foundries, Indiana Harbor, Ind.
Lawrence A. Shick, Chief Met., Republic Drill & Tool Co., Chicago, Ill.

Cincinnati District Chapter

A. Warner Armstrong, Sub-Foreman, Wright Aeronautical Corp., Lockland, Ohio
Fred Eveleigh, Sub-Foreman, Wright Aeronautical Corp., Lockland, Ohio
Walter A. Funck, Fdry. Foreman, Stedmans Foundry & Machine Works, Aurora, Ind.
*F. A. Klaine Co., Cincinnati, Ohio (J. H. Klaine, General Manager)
Henry F. Lussy, Sub-Foreman, Wright Aeronautical Corp., Lockland, Ohio
Joseph F. Roth, Jr., Supv., Wright Aeronautical Corp., Lockland, Ohio
John E. Wilson, Foreman—Coreroom, Wright Aeronautical Corp., Lockland, Ohio

Detroit Chapter

E. A. Barch, Fdry. Master Mech., Pontiac Motor Div., Pontiac, Mich.
French E. Bassett, Sales Mgr.—Defense Co-ordinator —Saginaw Malleable Iron Division, Saginaw, Mich.
E. Earl Beatty, Detroit, Mich., Dist. Mgr., Syntron Company, Homer City, Pa.
Joseph J. Clark, Ass't Met., Saginaw Malleable Iron Div., Saginaw, Mich.
John C. Davis, Lab., Saginaw Malleable Iron Div., Saginaw, Mich.
A. D. Fleetwood, General Foundry & Mfg. Co., Flint, Michigan
Frank Kruse, Molding Foreman, Detroit Steel Casting Co., Detroit, Mich.
A. P. Laffoon, Mgr., Mexico Refractories Co., Detroit, Michigan
Don L. Newton, Time Study, Aluminum Co. of America, Detroit, Mich.
Walter B. Slatery, Detroit, Mich., Salesman, Hercules Powder Co., Chicago, Ill.
Leslie M. Spencer, Cadillac Motor Car Div., Detroit, Michigan
Bruce Whiting, Plant Engr., Michigan Steel Castings Co., Detroit, Mich.

Metropolitan Chapter

Warren C. Andrews, Ass't Foreman, Wright Aeronautical Corp., Paterson, N. J.
Robert F. Cramer, Research Molder, General Electric Co., Schenectady, N. Y.
Thomas Fischer, Sub-Foreman, Coreroom, Wright Aeronautical Corp., Paterson, N. J.
James Gibson, Sub-Foreman, Molding Room, Wright Aeronautical Corp., Paterson, N. J.
John S. Horsburgh, Trouble Shooter, Wright Aeronautical Corp., Paterson, N. J.
A. Vernon Lorch, Ass't Fdry. Met., Eclipse Aviation Div., Bendix Aviation Corp., Bendix, N. J.
George H. Morel, Ass't Met., American Brake Shoe & Foundry Co., Mahwah, N. J.
Albert Pitoniak, Sub-Foreman, Coreroom, Wright Aeronautical Corp., Paterson, N. J.

Northeastern Ohio Chapter

Prof. G. B. Carson, Industrial Engineering, Case School of Applied Science, Cleveland, Ohio
D. H. Gairing, Ass't Supt., Ohio Injector Co., Wadsworth, Ohio
Ernest E. Hedler, Sales Repr., E. F. Houghton & Co., Cleveland, Ohio
Harry E. Leickly, Annealing Foreman, Fanner Mfg. Co., Cleveland, Ohio
F. E. Smith, Instructor, Industrial Engineering, Case School of Applied Science, Cleveland, Ohio.
John M. Urban, Fdry. Supt., Fanner Mfg. Co., Cleveland, Ohio

N. Illinois-S. Wisconsin Chapter

Claud B. Chiles, Pres., Rockford Standard Pattern Works, Rockford, Ill.
John Wm. Coffey, Chemist, Gunite Foundries Corp., Rockford, Ill.

Ontario Chapter

Percy L. Campbell, Mgr., Webster & Sons, Limited, Toronto, Ont., Canada
R. R. Campbell, Met., McKinnon Industries, Ltd., St. Catharines, Ont., Canada

*Company.

*Canadian Fanner, Limited, Hamilton, Ont. (J. S. Callaghan, Pres. and Gen'l Mgr.)
*Kerr & Coombes Foundry Co., Ltd., Hamilton, Ont. (George A. Coombes, Secretary-Treasurer)
*Potts' Pattern Works, Ltd., Toronto, Ont. (Earl Brooks, President)
*A. H. Tallman Bronze Co., Ltd., Hamilton, Ont., Canada (A. H. Tallman)
*Charles Tennant & Co. (Canada), Ltd., Toronto, Ont. (T. H. Schuessler, Sales)
United Kingdom Technical Mission, Ottawa, Ont., Canada

Philadelphia Chapter

E. H. Parker, Philadelphia, Pa. (Repr.), U. S. Hoffman Machinery Corp., New York, N. Y.

Quad-City Chapter

James H. Adamson, Appr., J. I. Case Co., Rock Island, Illinois
George T. Nickell, Appr., J. I. Case Co., Rock Island, Illinois
Ford R. Snyder, Fdry. Met., John Deere Tractor Co., Waterloo, Iowa

St. Louis District Chapter

E. J. Aubuchon, Ass't Sec'y-Treas., M. A. Bell Co., St. Louis, Mo.
David Callander, Foreman, Fulton Iron Works Co., St. Louis, Mo.
Ben Cox, Foreman, Fulton Iron Works Co., St. Louis, Missouri.
B. P. Glover, Tulsa, Okla., Sales, M. A. Bell Co., St. Louis, Mo.
T. C. Gundelfinger, Sales, M. A. Bell Co., St. Louis, Missouri
A. E. Hilliard, Sales, M. A. Bell Co., St. Louis, Mo.
Robert H. Jacoby, Met., Key Company, East St. Louis, Illinois
Louis Maier, Vice Pres. and Ass't Mgr., Missouri Pattern Works, St. Louis, Mo.
Lowell Phillips, Sales Repr., Fry-Fulton Lumber Co., St. Louis, Mo.
Gus Richter, Pres., Reeder & Richter Pattern & Foundry Co., St. Louis, Mo.
Michael B. Shea, Foreman, Fulton Iron Works Co., St. Louis, Mo.
Arthur Stephens, Foreman, Fulton Iron Works Co., St. Louis, Mo.
Harold Sticknote, Foreman, Fulton Iron Works Co., St. Louis, Mo.
E. D. Temperli, President, Temperli Pattern Co., St. Louis, Mo.

Southern California Chapter

*Aluminum Alloy Casting Co., Los Angeles, Calif. (J. Belanger, Pres.)
Wm. Braun, Foreman, Aluminum Co. of America, Vernon, Calif.
*Century Metalcraft Mfg. Corp., Los Angeles, Calif. (C. J. Amick, Vice Pres.)
*Compton Metals Co., Compton, Calif. (J. F. Cassel, Gen'l Mgr.)
Geo. Cottrell, Shop Foreman, Long Beach Iron Works, Long Beach, Calif.
C. H. DeLamater, Fdry. Supt., Aluminum Co. of America, Vernon, Calif.
Alex Fyffe, Fdry. Mgr., Ornamental Patt. Works & Bronze Fdry., Huntington Park, Calif.
Melvin H. Howard, Sales, Balfour, Guthrie & Co., Ltd., Los Angeles, Calif.
James H. Knapp, President, James H. Knapp Co., Los Angeles, Calif.
*Long Beach Iron Works, Long Beach, Calif (J. Donald Locke, Owner)
William McMullan, Maintenance, Reliable Iron Foundry, Inc., Los Angeles, Calif.
Tom C. Muff, Los Angeles, Calif., Sorbo-Mat Process Engineers, St. Louis, Mo.
*National Iron Works, San Diego, Calif. (Otto Tatus, Gen'l Mgr.)
J. O. Philips, Foreman, Aluminum Co. of America, Vernon, Calif.
*Rogers Pattern & Foundry Co., Los Angeles, Calif. (Albert E. Rogers, Owner)

Toledo Chapter

Jacob Burgy, Mold Foreman, Ensign Foundry Co., Toledo, Ohio
Harold R. Musch, Foreman, Coreroom, Ensign Foundry Co., Toledo, Ohio

Twin-City Chapter

R. M. Aker, Met., Western Alloyed Steel Casting Co., Minneapolis, Minn.
*Central Machine Works Co., Minneapolis, Minn. (E. G. Monson, Pres.)
H. J. Flaaten, Owner, Midwest Pattern Co., Minneapolis, Minn.
Gordon A. Harstad, Student, University of Minnesota, Minneapolis, Minn.
F. E. Kinsmiller, Gen'l Mgr., Brainerd Foundry Co., Brainerd, Minn.

Wisconsin Chapter

Raymond J. Giever, Fdry. Foreman, Belle City Malleable Iron Co., Racine, Wis.
Theodore John Gloudeman, Molder Appr., Kaukauna Machine Corp., Kaukauna, Wis.
E. Harder, Supt., Melting Dept., Falk Corporation, Milwaukee, Wis.
William John Laufenberg, Foreman, Bucyrus-Erie Co., South Milwaukee, Wis.
Chester A. Marcowka, Foundry Control, Ampco Metal, Inc., Milwaukee, Wis.
S. Mueller, Fdry. Research Dept., Falk Corporation, Milwaukee, Wis.
Ralph C. Schubring, Molder Appr., Kaukauna Machine Corp., Kaukauna, Wis.
A. Simonson, Vice President, Falk Corporation, Milwaukee, Wis.
Ernest R. Steinke, Fdry. Foreman, Belle City Malleable Iron Co., Racine, Wis.
Martin Wald, Foreman, Falk Corporation, Milwaukee, Wisconsin
E. J. Wellauer, Met., Falk Corporation, Milwaukee, Wisconsin

Outside of Chapter

Chaina & Cia., Rosario, Argentina, South America
*Companhia Siderurgica Belgo - Mineira, Siderurgica-Sabara, Minas Gerais, Brazil, S. A.
Stephen Davis, Supt., Southern Wheel Div., American Brake Shoe & Foundry Co., West Homestead, Pa.
Carlos Luis Ferrero, Engr., Arsenal Naval, Puerto Cabello, Venezuela, South America
J. V. Foley, Plant Met., Walworth Company, Boston Works, South Boston, Mass.
Avery L. Kearney, Student, Pennsylvania State College, State College, Pa.
Joseph J. Marsalka, Research Met., Blaw-Know Research Lab., Groveton, Pa.
Pedro Merlini e Hijos (Ing. Pedro F. Merlini), Buenos Aires, Argentina, S. A.
Percy Rastall, B. Sc., Director, J. Rastall & Son, Ltd., Manchester 16, England
Library, University of Texas, Austin, Texas

Castings Publicity

(Continued from Page 23)

control. This fact is becoming more evident every day. If they do not have such control and their products fail to measure up to the standards set by their customers (and under present conditions, the biggest customer is the U. S. Government), that immediately means a "black eye" for the remainder of the industry and casts suspicion on all cast products. Remember, it takes only one rotten apple to spoil the whole barrel.

Let us accept the spotlight of accomplishment for castings and their contribution to the National Offense program. But let us realize that we must now live up to the high quality standards set by that publicity. Let us further remember our responsibilities, individually and collectively, not only toward the welfare of our industry, but more, to the welfare of our country and its victory.

Analysis of Gray Iron Castings That Were Submitted in 1941 Apprentice Contest

By C. W. Wade,* Peoria, Ill.

For the past two years the Apprentice Training Committee has published in this publication a review of the patterns submitted by apprentices in the Annual National Apprentice Contest. Comments on these reviews were highly favorable. Consequently, the Committee decided to make a detailed study of the gray iron castings submitted by apprentices in the gray iron division of the 1941 National Apprentice Contest. The author has done a thorough job and comments upon each specimen as to its general appearance, soundness, gating and risering, and time.

FOR the past two years a "critical" review of the patterns submitted in the annual A.F.A. national apprentice contest has been made in this publication by Frank Cech, Cleveland Trade School, Cleveland, O. The volume of favorable comments received on these reviews has been so great that the Apprentice Training Committee thought such a review of the gray iron castings submitted in the annual apprentice contest would be of equal interest.

In these days of national emergency, interest in apprentice training has reached an all time high, because we are faced with a shortage of skilled men, who are just as vital to the welfare of this country as are the men in the armed forces. With the great shortage of skilled men, we can win this war only by systematic training of men, young and old, to do the tremendous job which must be done by American industry.

*Foundry and Patternmaking Training Supervisor, Caterpillar Tractor Co., and Member, Apprentice Training Committee.

Organizations Promoting Training

Several national organizations are doing a great deal to promote systematic training. The task is many-fold, but as yet the surface has only been scratched. The purpose of the A.F.A. contest is to bring apprentice training into the limelight and to promote greater interest among apprentices—our future men of industry.

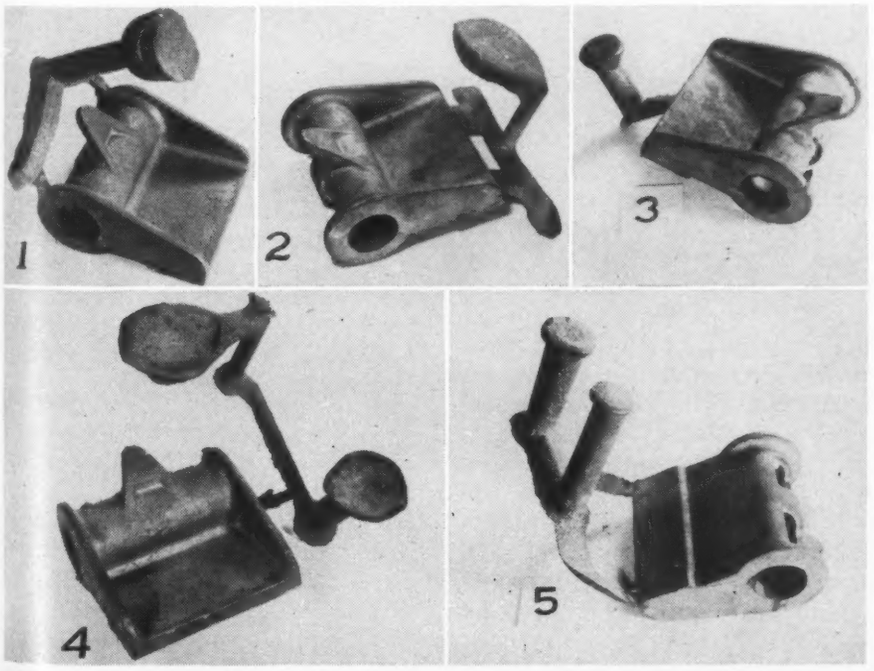


Fig. 1—Castings submitted by apprentices in the gray iron division 1941 A.F.A. National Apprentice Contest. Note the various types of gating and risering arrangements for this casting.

Before starting this review, the author would like to explain briefly what points were considered in judging these castings.

General Appearance: Refers to smoothness of surface, lack of patching, fins, clean corners, fillets, etc.

Soundness: Refers to lack of shrink holes, indications of slag and sand holes.

Gating and Risers: If contestant used good judgment in placing gates and using correct size of risers or in leaving off all risers, yet casting had a shrink hole due to quality of iron over which he had no control, he was so credited under this item. The ease with which gates and risers could be removed and finished casting after their removal also was considered.

Time: This factor is of minor importance and was so touched upon.

Coarse Sand Used

The sand used on specimen 1 in Fig. 1 (top—left) was a trifle coarse, causing the finish to be a little rough. The parting line was followed very closely, leaving a minimum of fins on the casting. The contestant did not ram the mold hard enough, consequently the casting has a swell on one side. The gates are shaped so they can be broken off with little danger of breaking into the casting; however, the rounded edges on the rib to to which these gates are attached will make it necessary for the grinder to exercise great care.

From all outward appearances, specimen 2, in Fig. 1 (top—center), has a fine looking, very smooth surface and contains no sand or slag inclusions. The

sprue is rather small, although it served its intended purpose, as there is a great deal of slag in the pouring basin. However, this contestant should have spent more time in analyzing his job before he started, because he did not follow the parting line.

Casting 3 in Fig. 1 (top—right) has a smooth surface finish. There are a few inclusions of sand and slag. The sand came from the slight crush at the rear of the casting (opposite the gate), and the size of the gate and the fact that it runs from the sprue directly into the casting accounts for the slag. One corner of the mold was patched and this shows very plainly on the casting.

Metal Wasted

The sand used by this contestant, specimen 4 in Fig. 1 (bottom—left), was too coarse and was either too weak or too dry for a casting of this size. This caused the casting's surface to be rough and to show where the sand had been washed by the iron. There are heavy fins on the side where it was gated (not shown by picture). A great deal of metal was wasted in the gates. Casting shows shrinkage on the rib which the author believes would have been eliminated by proper gating.

As shown in the picture, specimen 5 in Fig. 1 (bottom—right), has a rather rough surface finish. Gas was trapped in the inner wall of the cored hole, probably due to poor core venting. One gate extended past the edge of the casting and does not have a break-off fillet, thus making it very easy to break off into casting.

The surface of specimen 6 in Fig. 2 (top—left) is quite smooth with the exception of a few rough places in the drag. The parting line was followed very closely, thus giving very few fins. From outward appearances, the casting seems to be sound with the exception of small inclusions of slag. The strainer core was relied upon to keep out the slag, but it did not properly serve its intended purpose. The finished face was

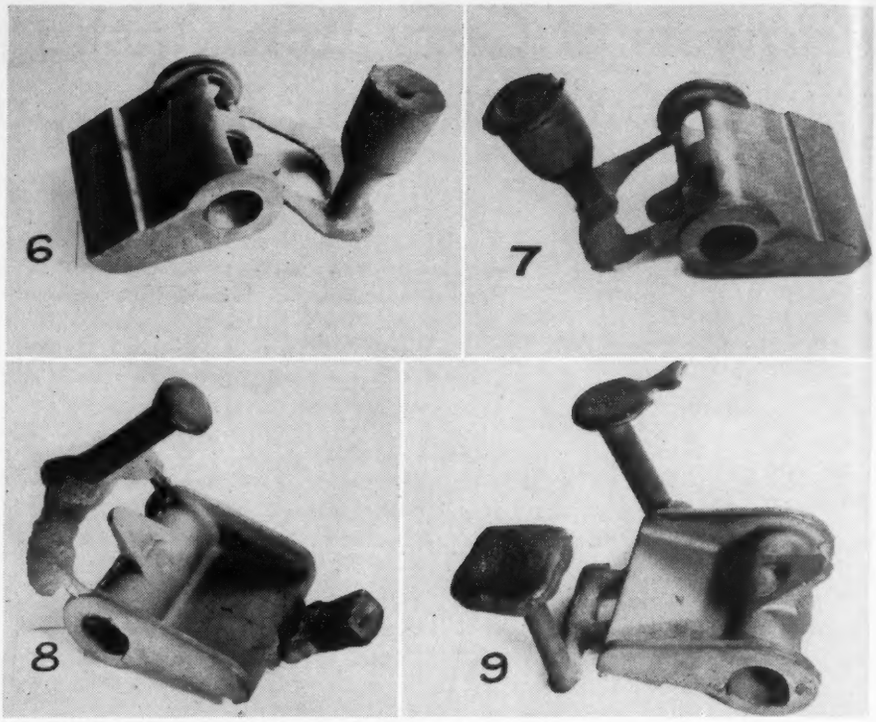


Fig. 2—Castings submitted by apprentices in the gray iron division 1941 A.F.A. National Apprentice Contest. Note the various types of gating and risering arrangements for this casting.

placed in the cope and had inclusions of slag. The gates are in a very unhandy place to grind off, also the absence of break-off fillets increases the possibility of their breaking off into the casting. The author is of the opinion that the sprue should have been more centrally located, thus giving an even flow of metal into both sides of the casting.

Good Finish

The finish on specimen 7 in Fig. 2 (top—right) is very good. The parting line was followed very closely, thus causing no fins. There is a slight crush on the back side of the round section and the sand was pocketed in the drag. The gates are in a very bad location in respect to cleaning. The time required to make this casting was rather low, which shows that the contestant either has a great deal of natural ability or a lot of experience in this type of molding.

Specimen 8 in Fig. 2 (bottom—left) has a fairly smooth surface. There are a few small sand and slag deposits which possibly would have been eliminated by putting the runner in the cope instead of the drag. The mold was not rammed properly, as this casting has a slight swell on one side. The fillet on the riser is not cut properly and there is a very great possibility that it might break into the casting.

Specimen 9 in Fig. 2 (bottom—right) has a finish that is rather rough. There are a few fins caused by contestant not following parting line, thus disturbing edge of mold when pattern was removed from the sand. Sand pocket on back side of casting was caused by a crush. The riser appears to be a waste of metal because due to its size it was probably placed on the casting to relieve pressure and not to take care of shrinkage, and in a mold of the size used, there would not be enough pressure created to warrant this additional opening. The fillet on the riser connection is not large enough and there is shrinkage in the casting at this point.

Sand and Slag Inclusions

Specimen 10 in Fig. 3 (top—left) has a very rough finish, leading the author to believe the sand used was much too coarse for a casting of this size. There are numerous inclusions of both sand and slag, due probably to method of gating. The in-gates are in the cope and the runner in the drag. Had this been re-

versed, thus giving a choking action, these defects could possibly have been eliminated. This casting also has a slight swell on the top face. The contestant either lacks molding experience or did not analyze the job properly because parting does not follow the regular parting line. There are no break-off fillets on the gates, which not only increases the possibility of a broken casting, but in this case shows a slight shrinkage at these connections.

Parting Line Not Followed

Specimen 11 in Fig. 3 (top—center) has a very nice finish on this casting. However, the parting line was not followed, thus leaving numerous fins on the casting. One corner on the mold was broken off and contestant did not patch it. There is no choke in the gate and, consequently, the casting has numerous inclusions of slag; also no fillets on the gates. Casting is shifted slightly. The time required to make this casting was very low, leaving the author to believe contestant thought more of this factor than quality.

The surface finish on specimen 12 in Fig. 3 (top—right) is fairly smooth. There are numerous sand inclusions (one can be seen in picture), coming from a crush on the side opposite the riser. The gates are attached in such a way that in breaking them off great care would have to be exercised. The riser is too far away from the casting to eliminate shrinkage and is not necessary to relieve mold pressure.

Specimen 13 in Fig. 3 (bottom—left) has a very smooth surface, but the casting has a great number of fins. Mold was patched in one place and from the appearance of the casting the author believes the contestant should have a great deal more practice in the use of patching tools. The presence of slag is due undoubtedly to metal running directly from sprue into casting with no provision having been made to trap impurities. There is no fillet on connection and casting shows a slight shrinkage here. The author can see no advantage in having the large volume of metal at the base of the sprue and it certainly detracts from the appearance of the casting.

The finish on specimen 14 in Fig. 3 (bottom—center) is excellent, far exceeding that of any other casting submitted. The parting line was followed very closely and there are no fins. The gates are so attached that a minimum amount of cleaning will be required. The runner and in-gates are very narrow and thin, which worked very nicely with this iron. However, the author would not recommend this type of gating in some foundries.

Used Poor Sand

The contestant who made specimen 15 in Fig. 3 (bottom—right) surely must have been a very new apprentice and mixed his own sand, as the author cannot conceive of any foundry using such sand as was used on this casting. The sand must have been very dry and of very poor quality, as the finish is extremely rough and shows plainly where the sand washed. The

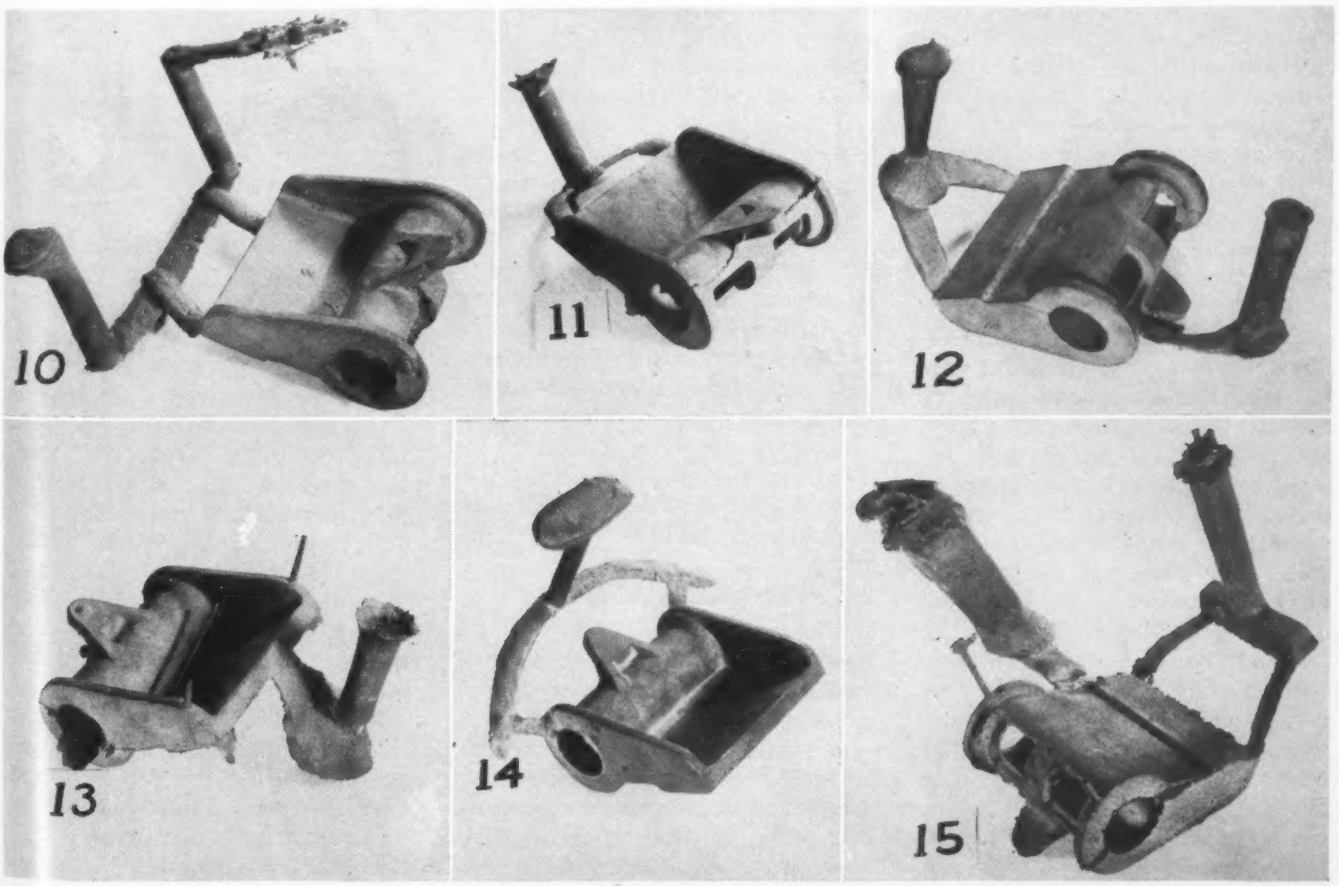


Fig. 3—Castings submitted by apprentices in the gray iron division 1941 A.F.A. National Apprentice Contest. Note the various types of gating and risering arrangements for this casting.

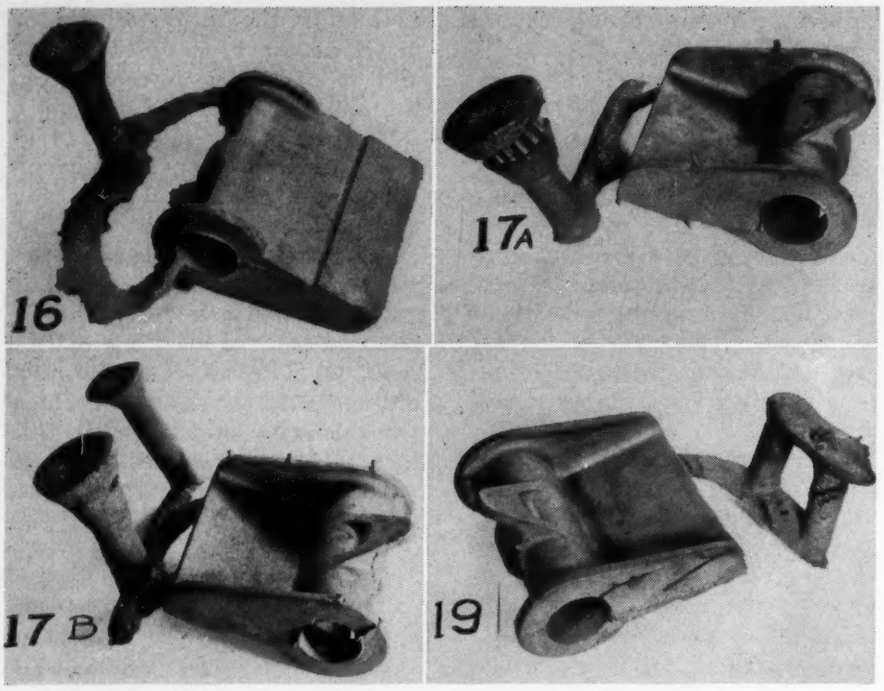


Fig. 4—Castings submitted by apprentices in the gray iron division 1941 A.F.A. National Apprentice Contest. Note the various types of gating and risering arrangements for this casting.

parting line was not followed and there are numerous fins on the casting. The riser was placed 2½-in. away from the casting and the connection is quite small, therefore, the metal in it must have solidified before that in the casting, thus defeating the purpose of the riser. This is very evident, as the casting shows shrinkage where the riser connections join to it.

Gates Easily Removed

This casting, specimen 16, Fig. 4 (top—left), has a very rough finish. The fins are probably due to the contestant not following the parting line on the pattern. There is not enough difference between the cross sectional area of the in-gates and the sprue, thus accounting for the slag inclusions. There is a small sand deposit in the casting which came from a slight crush on the side. The gates are placed in a very convenient place to be removed.

Specimen 17-A in Fig. 4 (top—right) has a surface finish that is not very smooth and shows signs of burning in. The strainer core was relied upon entirely to keep slag out of the casting, as the in-gates are the same height as the runner and have a greater area. It did not perform its duty properly, as some slag is present in the casting. The contestant took a great deal of time, but the casting has a very nice parting line.

Only a fair finish is on specimen 17-B, Fig. 4 (bottom—left), but this is probably due to the wrong grade of sand being used and soft ramming. The parting does not follow the parting line. The in-gates are the same height as the runner, plus larger in area, thus leaving all the choking action to the strainer core. Either the mold was not poured properly or the strainer core did not serve its intended purpose, as there are slag and sand inclusions in the casting. The numerous vents did not have a fillet on them and the casting shows shrinkage at these spots. The swell on the side convinced the author that the rough finish was due in part at least to soft ramming.

In-Gates to Be Sawed

The in-gates will have to be sawed off because if they are broken off there is a very great possibility they will break into the casting. From the various defects and the great length of time required to make this casting, it is believed by the author that this contestant should have a great deal more training in this type of molding.

Casting 19 in Fig. 4 (bottom—right) has a rough finish due in part to the wrong type of sand being used and the streak in the drag lead the author to believe powdered graphite was used on face of mold in such large quantities that it rolled up into the metal. Mold was patched and from quality of this job, contestant should have more experience in using slick. The author cannot see the advantage of the double sprue. If the contestant had in mind a skim gate, he defeated his purpose by pouring into both openings.

Conclusion

The winning castings were chosen by several competent judges. They rated the castings in each of the four factors previously mentioned, then averaged these ratings.

The majority of these castings are very good for commercial purposes and nearly every one has some characteristic which we would like to have in our ideal casting.

In the hands of apprentices lies the future of every industry. Men of industry must realize this and do all in their power to promote apprentice training. So, among other things, let's make the 1942 Apprentice Contests the largest and best in the history of A.F.A.

Prof. A. C. Davis Dies Suddenly at Ithaca, N. Y.

PROFESSOR A. C. DAVIS, Department of Experimental Engineering, Cornell University, Ithaca, N. Y., died suddenly on Tuesday, March 17. Professor Davis was a member of the Central New York chapter and a director of that chapter and helped to organize the successful Cornell Regional Conference meetings. He has served diligently on numerous A.F.A. committees taking special interest in sand research work. At the time of his death he was a member of the Foundry Sand Research Executive Committee and the Subcommittee of Physical Properties of Steel Foundry Sands at Elevated Temperatures. He also was chairman of the Subcommittee on Nomenclature, Foundry Sand Research Committee.

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F. J. Buckley, Kalamazoo Foundry & Machine Co., Kalamazoo.
G. W. Cannon, Jr., National Motor Casting Div., Campbell Wyant & Cannon Foundry Co., South Haven.
E. G. Carter, Standard Automotive Parts Co., Muskegon.
C. M. Clover, Clover Foundry Co., Muskegon.
A. E. Jacobson, Grand Haven Brass Foundry, Grand Haven.
J. C. Jensen, Battle Creek Foundry Co., Battle Creek.
O. G. Jentsch, Wolverine Brass Works, Grand Rapids.
J. W. Livingston, Blackmer Pump Co., Inc., Grand Rapids.
R. J. Teetor, Cadillac Malleable Iron Co., Cadillac.
C. P. Ziegler, Grand Rapids Foundry, Grand Rapids.

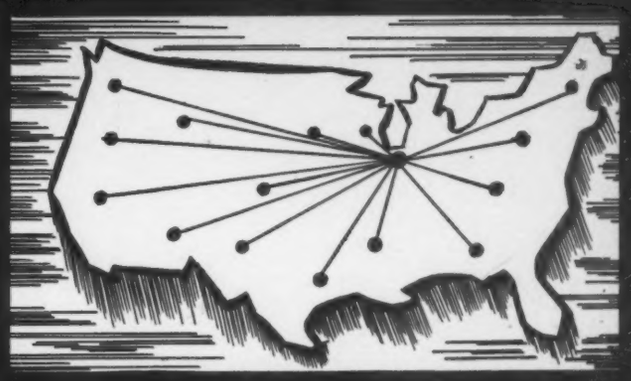
Twin City Chapter

Chairman—E. C. Madson, Andersen Foundry Co., Bayport, Minn.
Vice-Chairman—R. M. Aker, Western Alloyed Steel Casting Co., Minneapolis.
Secretary-Treasurer—O. W. Potter, University of Minnesota, Minneapolis.
Directors—Jack Bryant, Northern Pump Co., St. Paul.
Stuart Cameron, Valley Iron Works, St. Paul.
Fred Christensen, R. R. Howell & Co., Minneapolis.
Fred Kaim, Union Brass & Metal Mfg. Co., St. Paul.
E. H. Ryan, St. Paul Brass Foundry Co., St. Paul.
S. V. Wood, Minneapolis Electric Steel Castings Co., Minneapolis.

Toledo Chapter

Chairman—V. E. Zang, Steel Casting Div., Unitcast Corp., Toledo.
Vice-Chairman—W. A. O'Brien, Electric Auto Lite Co., Fostoria.
Secretary-Treasurer—R. T. Jansen, Steel Casting Div., Unitcast Corp., Toledo.
Directors—W. C. Adler, Ohio Steel Casting Co., Lima.
R. L. Binney, Binney Casting Co., Toledo.
L. Brown, Magnesium Fabricators, Adrian, Mich.
C. F. Carson, National Supply Co., Toledo.
R. A. Clark, Toledo Machine & Tool Div., E. W. Bliss Co., Toledo.
W. F. Erler, Modern Pattern Works, Toledo.
L. M. Long, Bunting Brass & Bronze Co., Toledo.

Chapter Activities



Robinson Presents Core Baking Data at Quad City

By J. Morgan Johnson,* Moline, Ill.

THE Quad City chapter's March meeting was held on Monday, March 16, at the Le Claire Hotel, Moline, Ill. There were 80 present for this meeting. A. H. Putnam, chapter chairman, A. H. Putnam Co., was the presiding officer.

The main speaker was L. P. Robinson, director of core sales, Werner G. Smith Co., Cleveland, O. His topic for discussion was "Variables Which Interfere with Proper Baking of Cores." He listed many of the essential items that should be considered in the baking of cores in regard to the type of oven used, the upkeep and maintenance of core room equipment, materials used, such as sands, cereal binders, and oils, and measuring and testing of cores. Many practical examples were used to stress the necessity of periodical checks in the core room in order to have proper cores for your molds and castings. Other factors discussed were moisture, temperatures, ratio of mixes, and climatic conditions that might be involved as variables to good or bad cores.

A very interesting and technical question period was conducted, with many questions on the various phases of making cores being given, with many viewpoints from various types of work and foundries.

*Tri-City Manufacturers' Assn., and Secretary-Treasurer, Quad City chapter.

Lowe at February Meeting

The February meeting of the Quad City chapter was held at the Blackhawk Hotel, Davenport, Ia., February 16. There were 65 present for this session.

The main speaker was John L. Lowe, metallurgist, Battelle Memorial Institute, Columbus, O., who talked on "Cupola Melting Operations." The construction and the operation of the

Covering the Wisconsin Regional Conference at random.
(Photos courtesy John Bing, A. P. Green Fire Brick Co.)

cupola was explained by the speaker. He referred to many researches that had been made on problems of the melting of iron in the cupola. Many illustrations of equipment used to combat some of the problems were given, with charts and tables recording their findings. Practical ideas were given that the speaker had found in use in various foundries throughout the country, which proved very interesting and educational to the foundrymen of this area. Research in this field of the foundry industry is becoming a very important factor in the production of good castings as was shown by the talk of Mr. Lowe.

Central Indiana Greets Robinson and Core Talk

By R. A. Thompson,* Indianapolis, Ind.

L. P. ROBINSON, Werner G. Smith Co., Cleveland, Ohio, was the guest speaker at the March 2 meeting of the Central Indiana chapter. A grand turnout of 90 men was on hand for the all-important lecture on "Variables Which Affect the Baking of Cores." Chapter Chairman H. B. Harvey, Indiana Foundry Corp., Muncie, was the presiding officer, while Chapter Vice Chairman B. P. Mulcahy, Citizens Gas & Coke Utility, Indianapolis, acted as chairman of the technical meeting.

One cannot imagine a talk by "Robbie" Robinson lacking in color or descriptive adjectives, and this was not one of them. He emphasized the importance of watching the fundamentals of core baking and the importance of keeping the core oven in condition so that it bakes evenly.

*Electric Steel Castings Co., and Secretary, Central Indiana chapter.

Aker Elected Chairman of Twin City Chapter

By O. W. Potter,* Minneapolis, Minn.

THE March meeting of the Twin City chapter was held on Monday, March 16, at the St. Anthony Commercial Club, Minneapolis, Minn. Dinner was served to 51 members and guests.

Following the dinner a brief business session was held and the officers for the ensuing year were elected as follows: *Chairman,* R. M. Aker, Western Alloyed Steel Casting Co., Minneapolis; *Vice-Chairman,* R. W. Bingham, American Hoist & Derrick Co., St. Paul; *Sec.-Treas.,* O. W. Potter, University of Minnesota, Minneapolis; *Directors* (to serve three-year term), R. C. Wood, Minneapolis Electric Steel Castings Co., Minneapolis; R. W. Jones, St. Paul Foundry Co., St. Paul; J. F. Staver, Staver Foundry Co., Virginia; (to serve two-year term), O. H. Trapp, Minneapolis-Moline Power Implement Co., Minneapolis; I. F. Cheney, Griffin Wheel Co., St. Paul; E. C. Madson, Andersen Foundry Co., Bayport; (to serve one-year term), E. R. Frost, E. R. Frost Co., Minneapolis; Fulton Holtby, University of Minnesota, Minneapolis; and Stewart Cameron, Jr., Valley Iron Works, Inc., St. Paul.

The program of the evening consisted of the moving picture, "Behind the Firing Line," shown by O. H. Read, A. P. Green Fire Brick Co., Mexico, Mo., and a talk by Milton H. Berns, Electro Refractories and Alloys Corp., Buffalo, N. Y., on the subject "The Manufacture and Care of Crucibles." The program was both entertaining and instructive and received high applause from those in attendance.

*University of Minnesota, and Secretary-Treasurer, Twin City chapter.

Blast Cleaning Talks at Western N. Y. Meeting

By Eliot Armstrong,* Buffalo, N. Y.

A DISCUSSION of blast cleaning equipment featured the March 6 meeting of the Western New York chapter. Bruce Artz and A. L. Gardner, Pangborn Corp., delivered the main addresses and presented their subject in a very interesting manner by using some pictures of outstanding foundry operations.

To help forget some of the snow that fell that night the chapter was fortunate to obtain the official American League's 1941 movie, "The Ninth Inning." It was a real treat for the members and they thoroughly enjoyed this movie.

*Inter-Allied Foundries of New York State, and Secretary, Western New York chapter.

A number of the speakers photographed at the Wisconsin Regional Conference.
(Photos courtesy John Bing, A. P. Green Fire Brick Co.)

Radiographic Inspection Discussed at Philadelphia

By B. H. Bartells,* Philadelphia, Pa.

THE regular meeting of the Philadelphia chapter, held on February 13 at the Engineers Club, was attended by approximately two hundred members and guests.

The after-dinner speaker, former Governor of New Jersey, Hon. Harold G. Hoffman, was introduced by Lee Harris, Link-Belt Co. Mr. Hoffman has had a wide experience in public affairs, having been a Congressman, Governor of New Jersey and at present Director of Unemployment Compensation in New Jersey. He is in demand as an after-dinner speaker because of his wit and humor and knowledge of current affairs. His talk on "Present Day Problems" was enjoyed by all.

The technical session was devoted to a discussion on "Radiographic Inspection of Castings," presented in a very able manner by Dr. Gilbert E. Doan, head, metallurgical department, Lehigh University, Bethlehem, Pa. Dr. Doan, who was introduced by the technical chairman, Bert Troy, metallurgist, Dodge Steel Casting Co., Philadelphia, Pa., is one of the foremost authorities on the use of radiography in testing and inspecting of castings. His work with the Naval Research Laboratory led to the use of gamma rays for radiographic testing.

With the use of slides, the speaker explained the methods, applications and results of the use of radiography in the inspection of castings. He explained how the foundry can avoid troubles and become in complete control of the quality of castings by the use of the method of testing. By inspection of a pilot casting, correction can be made and defective castings avoided.

An interesting discussion followed, in which R. R. Moore, Naval Aircraft Factory, considered the application of radiography from the foundry standpoint. Norman Mochel, Westinghouse Electric & Mfg. Co., considered the subject from the customer's viewpoint. Numerous incidents were cited where the quality of castings has been improved by the use of radiography.

*University of Pennsylvania, and Reporter, Philadelphia chapter.

Everett Speaks Before St. Louis on Engineering

By J. W. Kelin,* St. Louis, Mo.

A VERY fine crowd of St. Louis district foundrymen and friends attended the March 12 meeting of the chapter held at the DeSoto Hotel. Chapter Vice-Chairman C. B. Shanley, Semi-Steel Casting Co., acted as chairman in the absence of Chapter Chairman Carl Morken, Carondelet Foundry Co.

L. E. Everett, Kaukauna Machine Co., Kaukauna, Wis., was warmly received by the chapter as he is a past chairman of the St. Louis District chapter. His subject was "Foundry Engineering." He suggested procedure for the construction and planning of foundry layouts indicating the advantage of sequence layouts, carefully designed floor plans based upon necessary material handling, and other factors which would be of decided advantage and economy to the foundry builder and user.

*Federated Metals Div., A. S. & R. Co., and Secretary-Treasurer, St. Louis District chapter.

Romanoff Speaks Before Western Michigan Men

By Max Amos,* Muskegon, Mich.

ON the evening of March 2, members and guests of the Western Michigan chapter had their regular meeting at the Occidental Hotel in Muskegon, Michigan.

After a dinner, attended by about 45 foundrymen, including D. P. Forbes, Gunite Foundries Corp., Rockford, Ill., and vice president of the Association, the meeting was opened by Chapter Chairman D. F. Seyferth, West Michigan Steel Foundry Co., Muskegon, Mich.

Chairman Seyferth introduced Wm. H. Romanoff, H. Kramer & Co., Chicago, Ill., who later spoke to the group on brass-founding. He then introduced Mr. Forbes who spoke briefly on affairs of the National Association.

Next were shown interesting color movies, "Rainbow's End," through the courtesy of the Aluminum Corp. of America, and "Nickel Highlights," through courtesy of the International Nickel Company.

In Mr. Romanoff's talk, the speaker emphasized the importance of correct gating, pouring temperature and sand control in relation to the type of material used in non-ferrous production, going into detail on the various bronzes being produced in the defense program.

*Standard Automotive Parts Co., and Secretary-Treasurer, Western Michigan chapter.

Burton Explains How to Handle Men at N.I.-S.W.

By J. R. Cochran,* Rockford, Ill.

J. BURTON, Fairbanks Morse & Co., Beloit, Wis., gave an impressive address before the Northern Illinois-Southern Wisconsin chapter, March 10, on "Handling Men." Chapter Chairman George Minert, Gunite Foundries Corp., Rockford, Ill., was the presiding officer. Approximately 45 members and guests had gathered at the Hotel Wilson, Rockford, for this monthly meeting.

The speaker elaborated on his statement that the whole secret of getting along with men could be summed up in five words: "Give him a square deal." Workers expect their bosses and supervisors to be interested in them as individuals as well as in how much they can produce in a day. A square deal in wages, working conditions, reprimands, credit for good work and other items will pay big dividends to the company in loyalty. He further stressed the importance of developing such a system in plants today and showed how it was possible for one supervisor to tear down the good work of others by failing to do his part in the program.

*Metallurgist, Sundstrand Machine Tool Co., Foundry Div., and Technical Secretary, Northern Illinois-Southern Wisconsin chapter.

Study Cupola Operation at Northeastern Ohio

By Pat Dwyer,* Cleveland, Ohio

APPROXIMATELY 125 members and guests attended the March 12 meeting of the Northeastern Ohio chapter at the Tudor Arms, Cleveland, Ohio. Guests included C. E. Hoyt, convention and exhibits manager, and C. E. Westover, executive vice president and treasurer, from the A.F.A. office, Chicago, Ill. Following the usual list of announcements, Mr. Westover delivered a short address on the aims and objects of the coming A.F.A. convention and exhibition in Cleveland April 20 to 24. He said that all preliminary features were well in hand and indicated that the event in all probability would exceed in magnitude and general interest any affair of the kind staged in the forty-odd years of the Association activities.

A film, "Unfinished Rainbows," in technicolor, showing the origin, experimental work and development of aluminum to its present status in myriad uses in practically all fields of human endeavor was presented through the courtesy of the Aluminum Company of America.

The technical part of the program was covered in a paper on cupola control and recent developments in the production of special iron through the use of alloys presented by R. C. Good, metallurgical engineer, Electro Metallurgical Co., unit of Union Carbide and Carbon Corp., New York. He prefaced his remarks by comparison between former and present foundry conditions brought about by war emergency and the resulting restrictions and priorities. In the majority of instances casting specifications are higher than ever and the foundryman is faced with the problem of meeting these higher casting qualifications with base materials which require skillful manipulation of alloy additions. He described cupola operation in considerable detail to show how melting practice affects the resulting iron. Gas absorption, the cause of porosity, is influenced by three factors, temperature, melting speed and composition of the charge. Where alloys are added before or after tapping, the metal should remain in the ladle a sufficient time to allow them to act.

*Engineering Editor, *The Foundry*, and Reporter, Northeastern Ohio chapter.

Co-operation Emphasized Before Chicago Chapter

E. J. BRADY, Western Foundry Co., Chicago, Ill., discussed the all important subject of co-operation between foundryman and patternmaker in the production of castings at the March 9 meeting of the Chicago chapter. L. L. Henkel, Interlake Iron Corp., Chicago, and chapter chairman, was the presiding officer.

Prior to the main technical presentation, Chapter Vice Chairman Al Gierach, American Manganese Steel Div., Chicago Heights, introduced James Thomson, conductor of the Continental Roll & Steel Foundry Co.'s men's glee club. The glee club sang a number of selections for the membership.

Also present at this meeting was President Simpson, and he was called upon to discuss the Association's activities with special emphasis being made to the convention and the publicity campaign.

Mr. Brady, in his address, strongly advocated full co-operation between the patternmaker and foundryman and illustrated how such co-operation has resulted in the saving of time and expense in casting production. The numerous slides he showed were ample evidence of things that could come to pass.

Pittsburgh Non-Ferrous Night Features Keeley

By R. L. Hartford,* Pittsburgh, Pa.

ANNUAL non-ferrous meeting of the Pittsburgh Foundrymen's Association was held Monday, February 16, at the Roosevelt Hotel, Pittsburgh. The new sound and technicolor movie, "Unfinished Rainbows," prepared by the Aluminum Co. of America, was shown, describing the development of aluminum, its historical background, and some of its war-time uses.

Silicon bronzes were discussed by the speaker of the evening, R. J. Keeley, Ajax Metal Co., Philadelphia. Mr. Keeley stressed use of silicon bronzes as a suitable substitute for tin bronzes during the present emergency where shortage of tin has caused foundries to search for substitute materials. Sample castings of various types were displayed by the speaker, including several typical applications, as well as a number of test bars showing the methods used in gating and risering for best results in avoiding leaks from pin holes and similar defects.

*Pittsburgh Editor, *The Foundry*.

Detroit Chapter Holds Cadillac Motor Night

By O. E. Goudy,* Detroit, Mich.

THE Detroit chapter held "Cadillac Motor Company Night" at Huyler's Le Aiglon on Thursday, February 15, with about 100 in attendance. This was the fourth clinical meeting of the season and was divided into three parts, each of the three speakers covering a separate phase of the foundry operations.

Following the dinner, Chapter Vice Chairman F. A. Melmoth, Detroit Steel Casting Co., Detroit, introduced L. W. Thayer, assistant superintendent, Cadillac Motor Car Div., General Motors Corp., who, by means of slides, illustrated the various molding practices as they apply in their shop. After some interesting discussion, C. H. Hungerman covered the core room practice, describing the various core blowers, and pointed out several interesting points on core boxes and core mixtures, making particular mention of their preference of asbestos, rather than silica flour in the same mixes; also that about 2 per cent of iron oxide is used to prevent burning in on jacket and port cores.

The third speaker on the program was Chapter Director W. B. McFerrin, Cadillac Motor Car Div., General Motors Corp., who

*Kelsey-Hayes Wheel Co., and Director, Detroit chapter.

covered the melting and metallurgical phase. Dealing principally with the cupola operation, pouring temperatures, and other facts, Mr. McFerrin made mention of their placing steel on the coke bed to avoid high carbons at the start of operation.

Metropolitan Quiz "Kids" Hep to Foundry Facts

By R. E. Ward,* New York, N. Y.

WITH varied and interesting questions flung at them from every corner, the experts retaliated with valuable information at the March 2 Quiz Program of the Metropolitan chapter, held at the Essex House, Newark, N. J.

J. S. Vanick, International Nickel Co., was technical chairman for the evening. The board of experts consisted of R. J. Allen, Worthington Pump and Machinery Corp.; K. V. Wheeler, American Steel Castings Co.; T. J. Wood, American Brake Shoe and Foundry Co.; F. Biasotti, Neptune Meter Co., who substituted for D. Broggi of the Neptune Meter Co.; and D. J. Reese, International Nickel Co.

Tolerances, sand selection and preparation, directional solidification, porosity, grain size, physical properties and all other aspects of foundry practice were discussed. The relative merits of castings versus forgings also were discussed. The questions were many and covered all types of castings so that all those present benefited by the questions.

*Metallurgist, Eclipse Aviation Div., Bendix Aviation Corp., and Asst. Chairman, Publicity Committee, Metropolitan chapter.

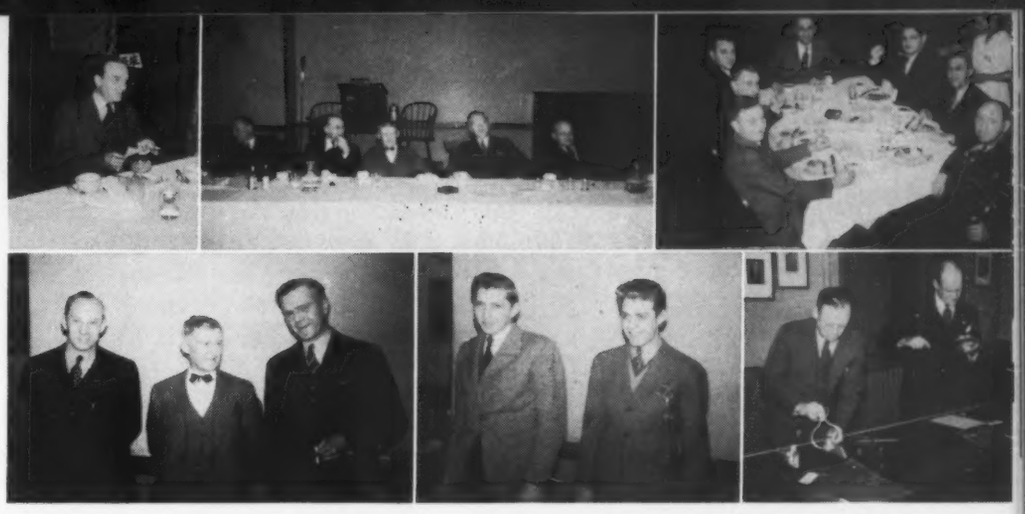
N.E.F.A. Receives Lesson on Powder Metallurgy

By M. A. Hosmer,* Boston, Mass.

THE regular monthly meeting of the New England Foundrymen's Association was held at the Engineers' Club, Boston, Mass., on March 11, with about eighty-five members and guests present.

The speaker of the evening was Gregory J. Comstock, Professor of Powder Metallurgy, Stevens Institute of Technology, Hoboken, N. J., who spoke on "Powder Metallurgy." This is defined as the art or science of the preparation of finely divided metal powders which are then put into the required shapes or forms for use. These powders are generally fine enough to put through a 100-mesh screen. Marked recent improvements were described in the process, which essentially consists of forcing the material into metal molds or dies under pressure, and subsequent heating at a temperature somewhat under the fusion point of the metal itself. This heating or sintering, as it is called, may take place at the same time that the metal is being pressed into the molds. Small bearings, bushings, tungsten lamp filaments and brake drums are typical examples of parts now being made.

*Chemist, Hunt-Spiller Mfg. Co., and Reporter, New England Foundrymen's Association.



(Photos courtesy F. Bruggman, The Gibson & Kirk Co.)

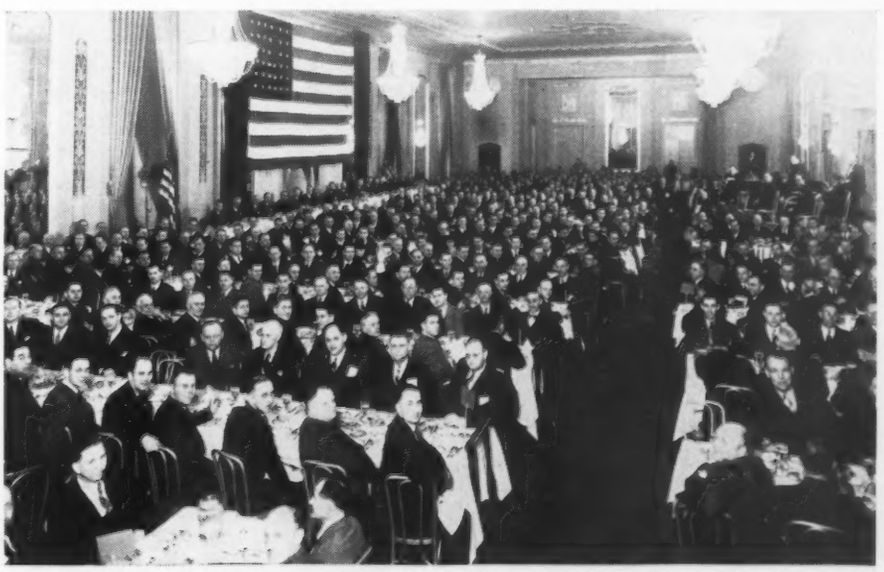
Pictures from Chesapeake taken at the February meeting. (Top—left) Chapter Secretary L. H. Denton. (Top—center) The head table. (Top—right) Part of the Chesapeake gang. (Bottom—left) left to right Frederick Bruggman, Pat Dwyer and Chapter Chairman E. W. Horlebein. (Bottom—center) left to right Edward Cosica and Jerome Petr, who submitted patterns to the national contest. (Bottom—right) John Greenstreet, Maryland Carwheel Co., and Walter Moviltz, The Gibson & Kirk Co., checking pattern entries.

Dwyer Finally Speaks at Chesapeake Chapter

By Frederick Bruggman*, Baltimore, Md.

AFTER several attempts the Chesapeake chapter finally succeeded in having the Dean of Foundrymen, Pat Dwyer, engineering editor, *The Foundry* talk to us on his favorite subject, namely, gates and risers. On the same evening that Mr. Dwyer spoke to us, Baltimore was experiencing its first blackout rehearsal, but Mr. Dwyer talked right on through the blackout and back to light again. The

* The Gibson & Kirk Co., and Reporter, Chesapeake Chapter.



Wisconsin chapter Regional Conference banquet.

meeting held at the Engineers Club on Friday, February 27, certainly was a big success. Mr. Dwyer's lecture and illustrated slides proved to be very interesting and instructive to the 75 people present.

In response to the announcement of Chapter Chairman Edwin W. Horlebein, The Gibson & Kirk Co., and through the efforts of John A. Heard, pattern shop foreman, Crown Cork & Seal Co., Edward Cosica and Jerome Petr, patternmaker apprentices of the same company, submitted patterns to be entered in the 1942 National Apprentice Contest. The patterns these two boys made were examples of fine workmanship. Walter Moviltz, foreman pattern shop, The Gibson & Kirk Co., and John Greenstreet, manager, Maryland Carwheel Co., spent several hours checking them and finally decided that the pattern made by Jerome Petr, had won by a small margin over the pattern submitted by Edward Cosica. As a reward each of the boys was presented with a Junior Membership in the Chesapeake chapter.

Ontario Receives Some Core Baking Pointers

By G. L. White,* Toronto, Ontario

AT the February meeting of the Ontario chapter, L. P. Robinson, Werner G. Smith Co., Cleveland, O., discussed variables that affect the baking of cores. Chapter Chairman W. B. Clarke, Steel Co. of Canada Ltd., presided at the meeting, with an attendance over the 100 mark. The speaker was introduced by Chapter Vice Chairman J. J. McFadyen, Galt Malleable Iron Co. Ltd.

Mr. Robinson pointed out that in the early days of coreroom practice many foundries built their own core ovens, in which the distribution of heat frequently resulted in burning of a proportion of the cores while in other sections of the oven baking would be incomplete Baffles have aided in giving more oven temperatures, and recirculators also have contributed to temperature control and fuel economy. The speaker stated that pyrometers are a necessity in core oven temperature control.

Also discussed was the necessity for a foundry not to lose castings due to cores. If a core is not good there should be no hesitation in throwing it out. This is particularly true in the case of intricate core assemblies where one poor core may ruin an important core assembly.

*Westman Publications Ltd., and Secretary-Treasurer, Ontario chapter.

Northern California Discusses Sand Problems

By Geo. L. Kennard,* San Francisco, California

THE March 13 meeting of the Northern California chapter was one of the best conducted by the chapter in many months. Chapter Chairman E. M. Welch, American Manganese Steel Div., presided over the gathering. Before reviewing the movie, "Sand," Chairman Welch gave a brief summary of the Del Monte meeting and the active part taken by A.F.A. President, H. S. Simpson, National Engineering Co., Chicago, Ill.

A coffee talk was made by V. B. Lawrence, Berkeley Public Schools, and he outlined the school department's plans for holding training classes for present foundry apprentices. This talk met with considerable interest and enthusiasm.

The movie, "Sand," prepared by Whitehead Bros. Co., Buffalo, N. Y., was shown. It presented a most interesting story of foundry sand. Ed Possum, Columbia Steel Co., aided in securing this film.

Following the show, the meeting broke up into three groups to discuss sand usage and various problems concerning sand control. Phil McCaffey, General Metals Corp., lead the discussion of gray iron men, while Charles Pierce, American Manganese Steel Div., had charge of the steel group. The non-ferrous session was headed by Herb Eggerts, Berkeley Brass Foundry Co.

*Northern California Foundrymen's Institute, and Secretary-Treasurer, Northern California chapter.

President's Night at Southern California

By W. D. Bailey, Jr.,* Los Angeles, Calif.

PRESIDENT'S Night for the Southern California chapter was held at the Clark Hotel, Los Angeles, February 17.

There were 100 members present to greet our National A.F.A. President, Herbert S. Simpson, president, National Engineering Co., Chicago, Ill. This meeting proved to be one of the most interesting of the year.

The meeting was called to order by Chapter President B. George Emmett, Los Angeles Steel Casting Co., Los Angeles.

President Simpson was introduced and gave a very interesting talk, reporting on the 1942 Convention to be held in Cleveland in April, and urging as many as possible to attend, explaining the Government would have a large exhibit displaying materials needed in our Defense Program. Such an exhibit would be of vital interest to everyone in the foundry industry.

M. F. Pendergast, Whiting Corp., gave a most interesting paper giving the history of the cupola since the year 1840. After this paper, a discussion followed, which certainly was of importance to the gray iron foundrymen.

*Westlectric Castings, Inc., and Secretary, Southern California chapter.

New Committee Members

Foundry Sand Research Committee—Executive Committee.

Stanton Walker, Consulting Engr., National Industrial Sand Assn., Munsey Bldg., Washington, D. C.

Gray Iron Division Alloy Cast Irons Committee — Subcommittee on Processed Irons.

T. E. Barlow, Fdry. Engr., Chairman, Vanadium Corp. of America, 2440 Book Tower, Detroit, Michigan.

G. A. Timmons, Met., Climax Molybdenum Co., 14410 Woodrow Wilson, Detroit, Mich.

Abstracts

NOTE: The following references to articles dealing with the many phases of the foundry industry, have been prepared by the staff of *American Foundryman*, from current technical and trade publications.
When copies of the complete articles are desired, photostat copies may be obtained from the Engineering Societies Library, 29 W. 39th Street, New York, N. Y.

Aluminum Alloys

MAGNESIUM. *"The Constitution of Alloys of Aluminum with Magnesium and Silicon,"* by H. W. L. Phillips, *Journal,* Institute of Metals (London), vol. 67, paper 905, pp. 257-273. The constitution of alloys of aluminum with 0-5 per cent magnesium and 0-2 per cent silicon has been studied in detail, and the position of the binary valleys bounding the primary aluminum phase field has been re-determined. The structure of the alloys under equilibrium conditions may be regarded as established, but little is known of their constitution as ordinarily prepared. The alloys were studied as slowly cooled, no attempt was made to attain equilibrium conditions. In this investigation the surface of separation of the aluminum-Mg_2Si binary complex was ridge-shaped, passing through a flat maximum at 594°C. Free silicon did not appear when the ratio of magnesium to silicon was that required for Mg_2Si, but requires an excess of magnesium for its suppression. The reaction between magnesium and silicon was a balanced one, and the free magnesium tended to be taken into solid solution by the aluminum. (Al.)

MAGNESIUM. *"The Constitution of Alloys of Aluminum with Magnesium and Iron,"* by H. W. L. Phillips, *Journal,* Institute of Metals (London), vol. 67, paper 906, pp. 275-287. The constitution of alloys of aluminum with 0-5 per cent magnesium and 0-2·5 per cent iron has been studied in detail, and the position of the binary valley bounding the primary aluminum phase field has been re-determined. Little was known of the constitution of these alloys as ordinarily prepared, but it was expected that metastable structures, due to undercooling and segregation, would be liable to occur. The constituents aluminum, $FeAl_3$, and Mg_2Al_3 form a eutectiferous system: the ternary eutectic, which contains about 33 per cent magnesium and 67 per cent aluminum, contains very little iron, and freezes at 451°C., a temperature which is practically identical with that of the aluminum-Mg_2Al_3 binary eutectic. The solid solubility of iron in aluminum is discussed and how the solid solubility of iron appears to be unaffected by the presence of aluminum. (Al.)

Casting

MOTOR FRAME. *"Interesting Technique Used on Motor Frame,"* by R. L. Hartford, *The Foundry,* vol. 70, No. 2, February, 1942, pp. 71, 136. An interesting technique is outlined in the production of a large dual ventilated motor frame casting. Eleven thousand pounds of gray iron were poured on this job, which ran 840 when finished. The frame was cast in a flask of four sections, consisting of a cope and drag and two cheeks. It was end poured. Eighty individual port cores were used. Three hundred and twenty perforated metal chaplets were used to keep the port cores in place while the mold was poured. Complete core weighed about 5500 lb. (Ca.)

POROSITY. *"Porosity in Aluminum Castings,"* by William Wilson, Jr., *The Foundry,* vol. 70, No. 2, February, 1942, pp. 64-65, 151-152. The Bendix Aviation Corp. has come to the conclusion that porosity in aluminum castings fall into four distinct classes; metal, gating, trapped air and gas, and shrinkage. In discussing each condition the author offers suggestions to eliminate porosity in the metal by using a cleaned pot, one free of any oxide; coat with a film of lime wash and dry; and a few other ideas. In gating, porosity can be controlled by using the right size sprue, use of choke in gate and number, location and size of gate. Venting aids a lot in getting rid of trapped air and gas in the mold. The fourth type of porosity is shrinkage and can be found when there is a variation in wall thickness, insufficient feed to heavy sections and lack of pressure. (Ca.)

SILICON BRONZES. *"Silicon Bronze Sand Castings,"* by M. G. Corson, *The Iron Age,* vol. 149, No. 5, January 29, 1942, pp. 46-49. With tin supplies scarce, foundries will be searching for substitutes for this metal in castings. Here, the substitution of antimony and silicon for tin in castings is discussed, with inherent advantages and disadvantages of these substitutes. (Ca.)

Cast Iron

WELDING. *"Arc Welding of Cast Iron,"* by "Arcite," *The Welding Industry* (London), vol. 9, No. 12, January, 1942, pp. 292-294. This is a review of the elementary physical, chemical and mechanical properties of cast iron of which a welder should be familiar. A short discussion on the characteristics of cast iron are listed; the effect silicon, phosphorus, sulphur, manganese, chromium and nickel have on welding is discussed; a typical analysis of gray cast iron is presented; a list of special cast irons are shown along with nitrogen hardened cast iron. Factors controlling welding procedure of these special cast irons are related. Malleable cast iron is discussed as is the characteristics of monel metal and its deposits on cast iron. The article is concluded with an outline of welding procedure. (C.I.)

Centrifugal Casting

GUNS. *"Casting Guns Centrifugally at Watertown,"* by Brig. Gen. R. W. Case, *The Foundry,* vol. 70, No. 2, February, 1942, pp. 62-63, 154-156. Centrifugal casting has greatly speeded the making of guns, for a single casting machine will turn out several gun tubes in the time it takes to forge one, and subsequent machining is reduced materially. At the Watertown Arsenal the personnel solved the various problems connected with this type of work after long investigation and study. A description of the molding machine is outlined as well as the pouring technique. The use of boring machines and other special machines are commented upon. (Ca.)

Core Oven

LARGE. *"Unusually Large Core and Mold Oven," Industrial Heating,* vol. 9, No. 1, January, 1942, pp. 78, 84. A description of a foundry oven installed to handle from 40 to 50 tons of molds and 100 tons of flasks and cars per load. It is approximately 40 ft. long, 16 ft. wide and 17 ft. high. Heating is done by a gas fired heating chamber outside the oven but built integrally with it. The oven is provided with automatic temperature control and the gas burners are completely interlocked with the air and gas supply lines. Due to increased production demands an increase in the load of molds has had to be made. Maximum loads of 57 tons have been properly baked. (Co.)

Cupola Practice

IMPROVING. *"Improving Cupola Performance,"* by D. J. Reese, *The Foundry,* vol. 70, No. 2, February, 1942, pp. 68-69, 140-144. A general review by the author giving some valuable pointers on cupola operation and practice for improving the cupolas performance. Blowers are frequently the weakness of a cupola melting unit and the author says when properly selected, centrifugal or fan type blowers are satisfactory. The use of air measuring devices such as pitot tubes, orfice plates, etc., are discussed by the author. The use of mechanical charging equipment is commented upon. Preheating of the cupola air and the various methods used today is explained. Moisture control cannot be stressed too heavily and the author tells what happens to castings when moisture in the air supply is excessive. Weighing metal as it is tapped from the cupola is illustrated and the advantages explained. A good metal distribution system and getting the metal to the molds with the least possible loss of temperature is told. (F.)

RAW MATERIALS. *"Cupola Raw Materials,"* by G. O. Loach, *Canadian Metals and Metallurgical Industries,* vol. 5, No. 1, January, 1942, pp. 6-9. The usual cupola charge is made up of certain percentages of some or all of the following materials: pig iron, steel scrap, foundry returns and purchased cast scrap. Taking each item as they appear above the author explains the importance of each and comments upon the purpose it serves in the charge. The

last section of the article explains the importance of the three remaining elements: sulphur, manganese and phosphorus. These elements do not play the important part in ordinary cast iron that carbon and silicon do, but they are quite important and will become more so as pig iron becomes scarcer. A few points are outlined to aid in improving existing cupola practice and include strict observance of charge materials, examination and periodic testing of cupola scales, inspection of the furnace lining before and after patching, the condition of the bed, try to run the furnace with a uniform blast and the importance of fluxing. (F.)

SHEET STEEL. *"Sheet Steel in Cupola Charge," Metal Progress,* vol. 41, No. 1, January, 1942, p. 75. A company submits a problem relating to the use of the scrap which they have available in their manufacturing process consisting of light steel sheet, ranging down to 30 gage, while the heavier material runs about No. 3 gage for melting as scrap. A suggestion is offered and then criticized by H. Bornstein, chief metallurgist, Deere & Co., Moline, Ill. (S.)

TAPHOLES. *"Cupola Tapholes,"* by J. Trimbell, *Foundry Trade Journal,* vol. 64, No. 1294, June 5, 1941, p. 377. Reliable spout operation is necessary from many points of view, easy tapping and stopping up, and pivots mainly on the shape and size of the taphole, also the material from which this item and the "botts" are made. The system set out in this article was developed with a view to overcoming some of the "snags" experienced with "made-in-place" tapholes. A suitable mixture for the bott is: 60 per cent fireclay, 30 per cent floor sand and 10 per cent fine coal dust, thoroughly mixed in a bucket and water added. Prior to botting, if it is dipped again in coal dust, contact with the stream of metal will not cause "splutter." (F.)

Design

See Furnace, Open-Hearth Roofs

Electric Furnace

RAMMED LININGS. *"Rammed Linings for Small Electric Furnaces,"* by Henry C. Fisher, *Metal Progress,* vol. 41, No. 2, February, 1942, pp. 187-191. In this article the author tells something of ramming mixtures in dry and semi-dry condition and the making of furnace linings from such mixtures. In lining a rotating furnace the necessary tools and equipment are listed and then a lining procedure is outlined for this type of furnace. A similar outline is made for lining an induction furnace. (F.)

Foundry Practice

WASTE. *"Wasteful Foundry Practice,"* by Paul R. Ramp, *The Iron Age,* vol. 149, No. 3, January 15, 1942, pp. 34-36. Much vitally needed pig iron, scrap and fuel are unnecessarily wasted each year, the author claims, through inefficient gating, feeding and melting practice. He lists in his article typical examples of such waste and how they may be corrected. (Ma.)

Furnace

CASE-HARDENING. *"Case-Hardening in Electric Furnaces,"* by K. Tichauer, *The Engineer and Foundryman,* vol. 6, No. 5, October, 1941, pp. 227, 229. The object of carburizing or case-hardening is to produce components with a tough core and a hard, wear and shock resisting surface, and can be attained by using a low-carbon steel and causing carbon to diffuse into the surface until its content is about 0.9 per cent. This penetration of carbon can be effected in three different ways. The pack carburizing method where the steel is enveloped in a carbon monoxide atmosphere through the combination of the oxygen in the air enclosed in the box with the carbon in the charcoal of the compound. In gas carburizing where the steel is exposed to the action of a hydro-carbon gas in a heated chamber. The third method, the work is immersed in a salt bath containing cyanide salts which yield the necessary carbon by direct or indirect action when heated in contact with the steel. In discussing these methods the author also presents the disadvantage of the pack method, information on the electric carburizer, furnace operation, operating costs and designation of the various carburizing methods. (F.)

INDUCTION HEATING. *"Induction Heating in War Production,"* by F. T. Chesnut, *Metals and Alloys,* vol. 14, No. 6, December, 1941, pp. 851-855. A broad picture of the extent to which inductive heating is a factor in the defense program is presented by the author. The many applications of induction heating—melting, forging, brazing, surface hardening and others—are discussed. Furnaces and processes are described. (F.)

MELTING. *"Melting Furnaces for Gray Cast Iron,"* by H. H. Sheperd, *Foundry Trade Journal,* vol. 65, No. 1308, September 11, 1941, pp. 171-172, 176. The various melting media dealt with in this article are crucible furnaces, air furnaces, electric furnaces, rotary furnaces and cupola furnaces. The introduction to this report contains a very useful table of classification of furnaces employed for the melting of metals, and the paper is concluded with a discussion of melting costs in which some very interesting and comparative figures are given. This report is not intended to serve as a detailed text book on the melting of cast iron—although there is a section dealing with cupolas and a detailed recommended practice for operating a 36-in. cupola—but merely to set forth a simple description of each type of melting furnace dealt with, and the essentials as to lining, repair and operation, together with typical examples and figures or operation as applied to cast iron. (C.I.)

OPEN-HEARTH ROOFS. *"Design and Construction of Basic Open-Hearth Roofs,"* by L. B. Lindemuth, *Steel,* vol. 109, No. 11, September 15, 1941, pp. 64, 186. Two major considerations and several minor ones have made it possible to construct a basic arch of open-hearth roof size which permit it to stand up under stresses and high temperature. The first is that a better brick has been developed for this purpose. It is a chrome-magnesite brick containing 60 per cent or more of chrome ore and made from carefully selected raw materials accurately screened to size, formed at high pressure and burned at high temperature. The second factor is the method of supporting the roof with the provision for expansion and contraction. Minor considerations are accuracy in laying bricks, use of metal liners between bricks and use of key bricks instead of wedges. (F.)

Gas

FOUNDRY USE. *"Gas in the Foundry,"* by John E. Hubel, *Industrial Gas,* vol. 20, No. 8, February, 1942, pp. 3-4. Description of two core-baking ovens in which cores are being baked in from 25 to 33⅓ per cent less time. The oven chamber of the first is 19 ft. long inside. It has a capacity of 1,000,000 B.t.u. per hour. Cores, according to the author, are perfectly baked regardless of location in the oven. Furnace No. 2 is a conveyor type oven 35 ft. long. Conveyor is equipped with variable speed transmission. The oven is equipped with a gas-fired external recirculating heating system. The heater has a capacity of 1,000,000 B.t.u. per hour and is connected to a heat-supply fan which delivers the heated air to the work through a duct system. The "wet" end of the oven which discharges the moisture and products of combustion through a stack to the atmosphere is described. How the heating system is regulated is commented upon and also safety equipment. (Fu.)

Hardness

METAL SURFACES. *"Surface Hardness of Metals,"* by B. Chalmers, *Journal,* Institute of Metals (London), vol. 67, paper 908, pp. 295-314. Details are given of a method for measuring the hardness of thin surface layers of metals and other materials, in which the reduction in optical reflectivity is determined when known quantities of sand are allowed to impinge on the surface under standardized conditions. Applications of this technique are described in cases where other methods of measuring hardness are unsatisfactory, and some indications are given of the possibility of applying the method to investigations on the properties of surface films. (Me.)

Hygiene

DUST. *"Foundry Dust," Safety Engineering,* vol. 83, No. 2, February, 1942, pp. 40, 42. Removal of dust at its source is considered the best method of control. If the dust is trapped where it is generated, collected and disposed of, it will not be dissipated into the atmosphere where men work. It is necessary to maintain good housekeeping conditions in the plant or dust will be moved into the atmosphere. All personal respiratory protective equipment should be checked over and cleaned continuously by the management in accordance with good practice. Dust control safeguards the health of the workmen and in this way helps to promote his efficiency and improve his morale. (Hy.)

Management

PROGRESS. *"Foundry Progress Control,"* by C. R. Nortcliffe, *The Metal Industry* (London), vol. 40, No. 2, January 9, 1942, pp. 18-20. An essential part of any efficient foundry organization is a system which allows work to be issued to the foundry according to a methodical and progressive routine, and which enables a balanced productive capacity to be maintained from week to week. A well-planned progress system can relieve the foundry manager of most of the worries by frantic customers calling about casting deliveries. Records and cards concerning past or current orders is available at a moment's notice instead of wasting time calling the customer or running around the plant to find out some detail. A separate department to handle all the paper-work connected with casting orders can be of great value and time saver. The system here described was developed for a foundry specializing in light alloys, but it is equally applicable to any foundry producing sand or machine molded castings. The author explains the

use of production reports and statements, what the foundry progress man should do and what the output and release chart means. (Ma.)

Non-Ferrous

POROSITY. *"Causes of Porosity in Tin-Bronze Castings,"* by T. F. Pearson and W. A. Baker, *Journal,* Institute of Metals (London), vol. 67, Paper 904, pp. 231-255. Extensive tests have been made to determine the influence of shrinkage and of dissolved gases on the incidence of porosity in tin-bronze, using a melting and casting technique which permitted very close control of all conditions and yielded strictly comparable test results. The bronzes are very prone to dispersed shrinkage unsoundness by reason of the long freezing range of the alloys. The alloys are also prone to unsoundness resulting from the evolution of hydrogen, water vapor, carbon monoxide and sulphur dioxide. Carbon dioxide and nitrogen are inert to the alloys. The reaction between water vapor and molten bronze is reversible and it is shown that oxidation and/or deoxidation are effective for the purpose of preventing or minimizing unsoundness resulting from exposure of melts to moist atmospheres. (N.F.)

Steel

CARBON AND LOW ALLOY. *"Getting Maximum Results from Carbon and Low Alloy Steels,"* by H. W. McQuaid, Nassu, vol. 4, No. 1, January, 1942, pp. 3-10. The author believes that structure and properties of steel are more indicative of its utility than chemical analysis, and discusses the heat treatment (both from a theoretical and a practical standpoint) that will give the best properties to low alloy and plain carbon steels. (S.)

HEAT TREATMENT. *"Mass Effect in the Heat Treatment of Steel,"* by C. M. Schwitter, *Industrial Heating,* vol. 9, No. 1, January, 1942, pp. 11-14, 16, 18. Mass effect is concerned with the relation between the cooling rate and the transformation rate of the steel. An "S" curve is shown describing in general terms the effect of temperatures and time in the phase transformation of steel. In this article only the upper hump of the curve, where it sweeps near the zero time ordinate, is considered. The author points out some practical disadvantages resulting from mass effect and comments on the means of avoiding mass effect. (S.)

IMPROVEMENTS. *"Recent Improvements in Quality and Production of Steel,"* by S. J. Cort, *Industrial Heating,* vol. 9, No. 1, January, 1942, pp. 62, 64, 66. This brief article covers developments made in slag and oxidation control and improvements in furnace design and furnace control of the open-hearth method of making steel. (S.)

MOLDING. *"Molding Problems in the Electric Steel Foundry,"* by E. J. Kelly, *Foundry Trade Journal,* vol. 66, No. 1324; January 1, 1942, pp. 3-5, 6. This paper relates to work done in the jobbing foundry producing between seven and eight thousand different castings ranging in weight from a few ounces to several tons, including some specialized types of castings. The fundamental principles of molding are the same for all metals. The methods used include green sand, skin-dried, dry sand, molds in core and strikle work. Every new pattern received in the foundry presents its own particular problem, and past experience of the molders is invaluable in determining the method to be followed. (S.)

QUENCHING. *"Methods for the Quenching of Steel,"* by M. H. Mawhinney, *Industrial Heating,* vol. 9, No. 1, January, 1942, pp. 26, 28, 30, 32, 34, 36, 38. This section of this continued article deals with the subject of methods for quenching steel considers batch type quenching, with especial reference to the equipment employed to handle large and small parts, rods, bars and other materials for this operation. (S.)

Steel Castings

HEAT TREATING. *"Heat Treating Cast Tank Hulls," The Iron Age,* vol. 149, No. 2, January 8, 1942, p. 39. A brief outline of the furnaces used by the General Steel Castings Co., Eddystone, Pa., in heat treating cast steel tank hulls. The furnaces mentioned have been in operation and proved very successful. A future furnace is now being designed and constructed for the treating of hulls for the new large (60-ton) and medium (29-ton) U. S. Army tanks. (S.)

Steel Furnaces

OPEN-HEARTH. *"Water-Cooled Equipment on Open-Hearth Furnaces,"* by J. B. Luckie, *Steel,* vol. 110, No. 2, January 12, 1942, pp. 70, 72, 89. Insulation of cooling media, such as charging doors, bridgewalls, ports, door frames and bulkheads is proving economical at open-hearth shops. Refractory of basic quality is held in place by studs welded to the metal. Insulated doors show life of 150 to 250 heats. (S.)

Steel Making

SILICON MONOXIDE. *"Silicon Monoxide,"* by C. A. Zapffe and C. E. Sims, *The Iron Age,* vol. 149, No. 5, January 29, 1942, pp. 34-38. Silicon monoxide not only may exist at steel-making temperatures, but may be of signal importance in the deoxidation process. Silicon monoxide may conceivably be formed in liquid steel from reduction of SiO_2 or from oxidation of Si. The five principal equations for such relations in the system Fe-O-Si-H are defined in the article and their thermodynamic properties calculated on the basis of results obtained from an investigation of silicon: oxygen equilibria in liquid form. Increasing temperatures and decreasing oxygen pressure favor the formation of [SiO]. Consequently, as [FeO] diminishes, the total oxygen content of steel may actually increase. Certain unexplained behaviorism of slags and refractories at high temperature may be caused by silicon monoxide. (S.)

April Chapter Meeting Schedule

April 1
Western New York
Todd Union, University of Rochester
WM. J. PICKARD,
Chairman, Board of Standards and Appeals, New York State
"The New Foundry Code"

✦ ✦

April 6
Central Indiana
Washington Hotel, Indianapolis
H. C. AUFDERHAAR,
Electro Metallurgical Co.
"Alloys and Foundry Control"

✦ ✦

April 7
Western Michigan
Occidental Hotel, Muskegon

✦

Cincinnati
Hotel Netherland Plaza
CHAS. W. JONES,
Wm. H. Block Co., Indianapolis, Ind.
"Personnel Relations"

✦ ✦

April 10
Philadelphia
Engineers Club, Philadelphia
CAPTAIN SMITH
"Victory Night"

April 13
Chicago
Top of the Town Restaurant
Sectional Meetings—Gray Iron and Malleable

D. J. REESE, International Nickel Co.
"Cupola Practice for High-Test Iron"

Steel—S. MCGINTY
Burnside Steel Foundry Co.
"Pouring Methods and Care of Ladles"

Non-Ferrous—E. W. SMITH,
Eugene W. Smith, Inc.
"Sand"

✦

Quad City
R. G. MCELWEE,
Vanadium Corp of America
"Alloy and Treated Cast Irons"

✦ ✦

April 14
Michiana
Hotel La Salle, South Bend
"Home Talent Night"

Northern Illinois-Southern Wisconsin
Hotel Hilton, Beloit, Wis.

✦ ✦

April 17
Wisconsin
Hotel Schroeder, Milwaukee

✦ ✦

Lecture Course Meetings

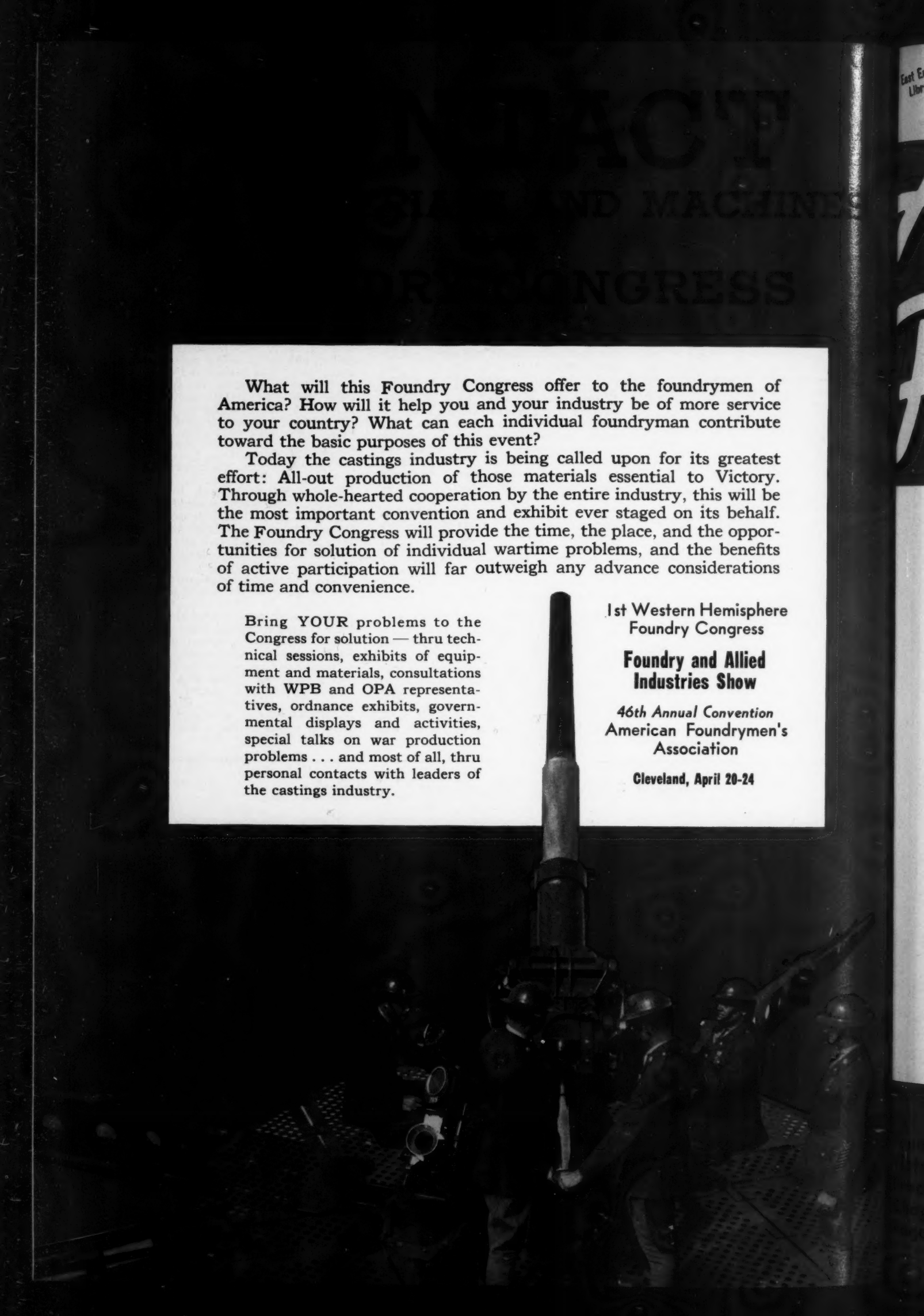
April 3
Detroit
University of Detroit
Chemistry Arena

✦ ✦

April 10
April 24
Birmingham
Tutwiler Hotel

✦ ✦

April 7
April 14
Chicago
Peoples Gas Building
Auditorium


What will this Foundry Congress offer to the foundrymen of America? How will it help you and your industry be of more service to your country? What can each individual foundryman contribute toward the basic purposes of this event?
Today the castings industry is being called upon for its greatest effort: All-out production of those materials essential to Victory. Through whole-hearted cooperation by the entire industry, this will be the most important convention and exhibit ever staged on its behalf. The Foundry Congress will provide the time, the place, and the opportunities for solution of individual wartime problems, and the benefits of active participation will far outweigh any advance considerations of time and convenience.
Bring YOUR problems to the Congress for solution — thru technical sessions, exhibits of equipment and materials, consultations with WPB and OPA representatives, ordnance exhibits, governmental displays and activities, special talks on war production problems . . . and most of all, thru personal contacts with leaders of the castings industry.
1st Western Hemisphere Foundry Congress
Foundry and Allied Industries Show
46th Annual Convention
American Foundrymen's Association
Cleveland, April 20-24